

THE LARYNGOSCOPE.

VOL. XXI. ST. LOUIS, DECEMBER, 1911. No. 12.

ORIGINAL COMMUNICATIONS.

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SOME OBSERVATIONS UPON THE CRIBRIFORM PLATE AND OLFACTORY NERVE IN MAN AND CERTAIN ANIMALS.*

BY JOHN J. KYLE, M. D., INDIANAPOLIS.

In the consideration of the subject of the cribriform plate and olfactory nerve of vertebrates, I shall briefly discuss the anatomy and function of these structures as observed in the study of the fish, frog, reptile, bird and mammals. Under the heading of mammals, I shall confine my observations to man and certain well-known types of herbivorous and carnivorous animals.

Dr. J. M. Ingersol, of Cleveland, and Dr. Joseph Beck, of Chicago, have added valuable information to our knowledge of the comparative anatomy of animals, the former through the study of the turbinates, and the latter through that of the sinuses and mastoid process. Our guest of to-day, Dr. Albert A. Gray, of Glasgow, Scotland, has contributed extensively to the study of the labyrinth, and Dr. Casey Woods, of Chicago, has collected a great amount of information relative to the eyes of certain animals. There is yet much valuable information in comparative anatomy of the eye, ear, nose and throat to be collected, which, when once compiled, will be interesting and extremely valuable.

In man and animals, the sense of smell is governed, relatively speaking, by the size of the cribriform plate and olfactory and respiratory turbinates. Environment has a great deal to do with the acuteness of the sense of smell and with each change in environ-

*Read as part of the Annual Address of the President of the American Academy of Ophthalmology and Oto-laryngology, before the Sixteenth Annual Meeting of that society, Indianapolis, Indiana, September 25, 1911.

ment, there is a corresponding change in this sense, commensurate with the necessities of the individual. In the ascent of man there has been a general progressive loss of the sense of smell, which is directly traceable to his indoor life and constant exposure to the evil effects of bad ventilation and superheated rooms, predisposing him to diseases of the nasal cavity and structural changes in the olfactory and turbinal mucosa, with a corresponding loss of the sense of smell. Men who inhabit the fastnesses of the forest or the open plains possess a much higher olfactory sense than those who are compelled to live in towns and cities. Animals in captivity probably suffer a proportionate loss. An acute sense of smell can only come by a life in the open.

Monkeys do not possess the acute sense of smell possessed by most quadrupeds, the cribriform plate being seen as a small, narrow slit on either side of the crista galli.

In the wild carnivora the sense of smell is most acute, for this is essentially the important factor in self-preservation. In this class of vertebrates the olfactory nerve and cribriform plate are highly developed. In the higher types, other senses become developed relieving the olfactory organ of much of its early function, but with a corresponding loss of acuteness.

In the tiger, wolf and dog the sense of smell is a more important factor in the chase than sight and hearing. The vision of the dog, for instance, is much less highly developed than its smelling capacity.

The cribriform plate, with its various number of perforations, is always present in both the carnivora and herbivora, and, in fact, in all mammals a want of development is the exception. In some of the lower mammals the nerve enters the skull via one opening. This, however, is exceptional.

The olfactory acuteness may be said to be in proportion to the distribution of the olfactory nerve to the nasal mucosa. In some animals and in man the sense of smell is highly developed for special odors. Certain carnivora restrict their diet to a few articles of food and deliver their attack only in a particular manner. They do not comprehend, or if they comprehend, they ignore those substances unnecessary to their sustenance. For instance, the weasel differs from the great cat tribe in that its sense of smell is not restricted and consequently it kills everything and anything in its power, while the feline, whose sense of smell is highly developed in one direction and very much restricted in others, kills only for sustenance.

The olfactory nerve in birds varies greatly in size and termination, the nerve passing through a single opening to the nasal cavity. In all birds, with the exception of the apteryx, a bird found in New Zealand, there is only one opening through the bone which corresponds to the cribriform plate in mammals, and the size of the opening and the distribution of the nerve to the nasal mucosa is, as in other vertebrates, in proportion to their necessity. In the vulture, for example, "the size of the olfactory nerve is about four times greater than observed in the turkey" (Owen). In the turkey the nerve ramifies upon the middle turbinate, whereas, in the vulture the nerve is distributed to the upper and middle turbinals and septum. The sense of smell in the vulture, from the wide distribution of the nerve, is thus far greater than in the turkey. It is probably true that in most birds the sense of smell is subservient to vision, but carrion-eating birds have sight as well as smell, highly specialized.

I am able to show to-day slides of one or two birds which will give a very good idea of the variation in the size of the opening in the ethmoidal bone.

The olfactory nerve in frogs and reptilia is much like that observed in birds, in that the nerve has only one opening for passage into the skull to the fore-brain. In the reptile the peripheral ending of the nerve is upon the so-called middle turbinate, which is found upon the lower wall of the intranasal chamber. Generally speaking, there exists in the reptile, two nasal chambers, the outer and the inner.

In the examination of the crocodile and snake skulls, which I shall show to-day, a single turbinal will be seen. The course of the nerve-fibers over the middle turbinal to the olfactory bulb can be easily differentiated in the crocodile, which is a higher type of reptile. In the crocodile, the region of the nose above the bridge of bone supporting the vomer, is known as the olfactory region, and that portion below, as the respiratory region.

In discussing the olfactory nerve of man, I want to review briefly a paper by Effie A. Reed, published in the *American Journal of Anatomy*, Vol. 8, 1908, and I shall also show some slides taken from this article, which will correct some of our former wrong impressions relative to the size and distribution of the olfactory nerve to the nasal mucosa.

There is a paucity of knowledge relative to the cribriform plate and olfactory nerve in man. Certain general statements are set forth in text-books on anatomy and books relating to our specialty,

in regard to the distribution of the olfactory nerve, which, however, convey little definite information. Since in all vertebrates the olfactory nerve and its distribution are much alike, this will be the only reference to the minute anatomy that I shall make.

By the olfactory nerve we mean the sensory nerve-fibers which connect the nasal mucosa with the olfactory bulb. The olfactory area in man was described by Scarpa as covering the entire upper turbinals, some of the fibers even extending to the middle turbinal and septum. Some of the fibers of the septum were depicted as reaching to the floor of the nose. Other anatomists have described the nerve as occupying a small portion of the upper turbinate and likewise a small portion of the septum adjacent to the cribriform plate. According to Reed, "the olfactory nerve covers the entire superior turbinate reaching nearly to its free edge to about three-quarters the width of the lower wall and occupying about one-half of the septum."

The extent of the olfactory epithelium is far greater in certain animals than in man. Observation of the structure of the ethmo-turbinal in the tiger, for example, as shown by the accompanying picture, will clearly demonstrate that the ethmo-turbinal springs from the cribriform plate and grows solely to the attachment of the olfactory nerve, as it were. Other illustrations of different animals will show clearly this same analogy as shown by animals that live by their sense of smell.

In many text-books on anatomy, as well as those relating to our specialty, we find illustrations showing the complete anastomosis of the nerve-fibers going to the olfactory bulb. Sometimes we read in the text-books that such an anastomosis of the nerve-fibers really exists. Other writers leave us in doubt and say the nerve fibers lead to the olfactory bulb. Dr. Lennox Brown comes as near as any authority I have observed among specialists in giving a correct description of the anatomy of the nerve, and says that the nerve "consists of about twenty-five olfactory threads from the under surface of the olfactory bulb, these descend to the nose, sheathed in the processes of the dura mater through the foramina in the cribriform plate. The greater number of these filaments pass through an outer row of perforations; fewer through the inner row. The fibers of the outer row are divided into two sets—the posterior going to the upper turbinal, and the anterior to the anterior part of the olfactory groove; while others are distributed to the roof. The nerves form a close net-work on the bones and the branches proceed to end in the olfactory mucous membrane."

It would be better and more accurate, from my observation, to describe the olfactory nerves as covering the roof, the upper third of the septum, the superior turbinate to its free edge and the anterior superior half of the middle turbinate, terminating, for the most part, in the region of the olfactory cleft.

The old anatomist Scarpa, gave a nearly accurate picture of the arrangement of the nerve-fibers as they spread out over the turbinal body and septum.

The anastomosis and net-work arrangement as described by Brown and others, is more apparent than real. The apparent anastomosis of the nerve-fibers, as described by most anatomists and writers, is a crossing and recrossing of nerve-fibers, as can be seen in the illustrations. The plexiform appearance, or net-work, is due to ramification of blood-vessels, according to Reed, and connective tissue which surrounds those vessels and nerves.

I also find that some of our modern writers describe the pituitary sinus as possessing olfactory nerves and function. These assertions are contradicted by Reed and others. In opening the sinus, no regard should be paid to this non-existing function. The ledge of bone representing the superior turbinated body only should be preserved, provided one cares to keep intact the olfactory sense. The peripheral ending of the olfactory nerve as well as the olfactory hairs, which extend into the nasal cavity run directly to the olfactory bulb. The olfactory hairs resemble in function the rods and cones of the retina or the terminal or outer hair-cells of the cochlear nerve, and when once destroyed, are never reproduced.

It is reasonable to presume that the olfactory cells can be destroyed by suppuration or pressure in the olfactory region of the nose, and if they are all destroyed, anosmia results. Anosmia, by way of discussion, may also result from traumatism of the olfactory axon or lesion of the bulb or sense centers. I think we should be very careful in the application of irritating substances to the olfactory region of the nose, for traumatism is very liable to destroy some of the sensory hair-cell.

In conclusion, I wish to apologize for being unable to present a more complete analysis of my subject and for making no reference, through lack of time, to the vomero-nasal or Jacobson's organ.

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THE INFERIOR TURBINATE; ITS LONGITUDINAL RESECTION FOR CHRONIC INTUMESCENCE.*

BY OTTO T. FREER, M. D., CHICAGO.

Venous distention of the inferior turbinated bodies is the commonest impediment of nasal respiration. As a transient symptom it is characteristic of acute rhinitis and the inhalation of dry air in overheated rooms, and is then of little moment; but when more lasting causes make it a constant affection, its radical treatment becomes necessary.

While the condition is merely one of vaso-motor relaxation of the muscular coats of the cavernous net-work of veins of the mucous covering of the inferior turbinated body and is not, as it is often miscalled, an hypertrophy, it is quite as obstructive as if its character were more substantial.

Both lower turbinates may be swollen at the same time, but often, when one enlarges, the other becomes retracted, swelling again, when the first one shrinks.

The appearance of the pillow-like, smooth, red, or reddish pink, intumescent lower turbinated body is familiar to all who look into noses. If enough distended, it may be seen to lie in contact with the septum and middle turbinated body, thus blocking the naris completely, a probe sinking into it as if into an air-cushion. Upon the application of adrenalin the turbinate shrinks at once to its normal dimensions, but swells up again in a short time.

In contra-distinction to intumescence, in true hypertrophy the surface is pale pink, and not smooth, but nodular, or pebbly, often resembling adenoid vegetations in aspect. Indeed, the condition is mainly due to hypertrophy of the adenoid layer of the mucosa. Only partial retraction takes place under adrenalin and the hyperplastic mucosa feels firm when touched with the probe.

Another condition for which intumescence might perhaps be mistaken is syphilitic infiltration of the turbinate mucosa. Syphilitic infiltration is, however, less likely to be taken for intumescence than for true hypertrophy, from which, indeed, it may be undistinguishable in aspect unless a close view shows some ulceration, ulceration never being present in hypertrophy, while at least a trace of it is rarely lacking in the syphilitic process. Syphilitic infiltration

*Read before the Meeting of the Chicago Laryngological and Otological Society, February 21, 1911.

with insignificant ulceration, easily overlooked, is not rare and should be in the investigator's mind.

As compared to intumescence, true, simple hypertrophy of the inferior turbinated body and syphilitic infiltration are rare. In many cases the intumescence affects especially the posterior end of the lower turbinate, which dilates to a globular swelling seen by posterior rhinoscopy to touch the septum, or, in extreme cases, even to protrude into the naso-pharynx, hiding the choana and, when bilateral, lying in contact with its fellow of the other nostril behind the septum. The irregularities of the naturally pebbled surface of the posterior end of the lower turbinate are exaggerated by the distention into small nodules so that the condition is usually mistaken for an hypertrophy and is often so portrayed in illustrated text-books. Nevertheless, it vanishes completely under adrenalin.

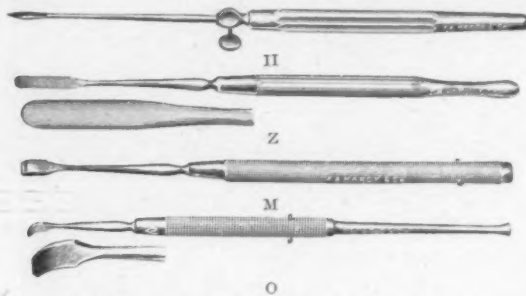


Figure 1. II, Myringotomy knife with scalped blade for first incision and to start the denudation; Z, long, sharp-edged elevator; M, chisel and O, raspatory of Freer septum set.

The cause of persistent venous swelling of the inferior turbinate may be merely the sluggish circulation accompanying a sedentary life, the nasal passages opening temporarily in such cases, as soon as exercise removes the excess of blood from the veins of the body.

Prolonged intumescence is also characteristic of hay-fever and vaso-motor coryza. Its commonest cause, however, is some permanent fundamental obstruction to nasal breathing, such as a deflection of the septum, or a constriction of the skeleton of the nasal fossae which makes them too narrow or too low for proper capacity.

According to its amount, the fundamental interference with the air-current makes needed a compensatory excess of inspiratory effort which, if it reach a degree that causes it to exert suction upon the mucous lining of the nares, as well as draw in air, makes the most yielding and distensible portion of the mucosa, that covering the inferior turbinated bodies, swell as if under a cupping

glass. As this excess of inspiratory suction goes on night and day, it need not be very great to lead in time to persistent intumescence, only occasionally opposed by a temporary vaso-motor retraction. In this manner a moderate fundamental obstacle may in time become the source of marked intumescent obstruction; for the condition, once started, aggravates itself by adding to the intensity of the inspiratory effort needed to overcome it. Not all fundamental obstacles result in intumescence, for the covering of many turbinates is atrophic and fibrous and does not yield to suction.

The proper treatment of intumescence depending upon a fundamental obstruction is to remove this obstruction surgically if it may be done. This is possible in the case of deflections, but not where the construction of the nares is generally contracted. In such instances the turbinated bodies themselves must be reduced in size and prevented from swelling, as they must also be in the cases where persistent turbinate intumescence takes place in normally roomy nares, or remains in spite of the correction of a deflection.

Because venous intumescence of the inferior turbinate is a vaso-motor phenomenon and not of inflammatory origin, local applications have no appreciable effect upon it, and its treatment has long become surgical.

For many years the galvano-cautery or chemical caustics were the main reliance, the design being to bind the tumefied mucosa to the turbinated bone by the resulting scar. This treatment, however, proved uncertain. In some cases perfect and permanent freedom of nasal breathing was obtained. In others the retraction of the turbinate was only partial and transient, the condition soon returning, so that a long series of cauterizations became necessary. Cases where a fundamental obstruction caused the intumescence were usually not benefited by the cautery, while it often created adhesions between the septum and outer wall of the nose which left the patient worse off than before.

Rhinologists, therefore, have in a large measure abandoned cauterization for intumescence and have adopted the more radical procedure of turbinotomy instead, the turbinate being wholly or almost cut away with the saw, scissors, or punch.

The objection to these methods has, in my experience, proved to be the creation of a ragged, bad stump, the mucous membrane, cut off at a level with the bone, retracting from it and leaving it exposed. Under these conditions, the removal of the tampon often re-opens vessels in the open wound and leads to serious bleeding, which makes re-packing under unfavorable circumstances necessary. The wound must heal by tedious granulation extending over weeks,

hard scabs forming upon the raw surface, their removal by the patient in blowing his nose sometimes causing severe nose-bleed many days after the operation. I have not, however, after turbinotomy performed even in this crude manner, found the permanent chronic scabbing described by some authors and have found that in time the stump always heals over smoothly; nor have I ever seen atrophic rhinitis as a consequence of even the complete removal of an inferior turbinate, atrophic rhinitis being a distinct pathological process which cannot be surgically created.

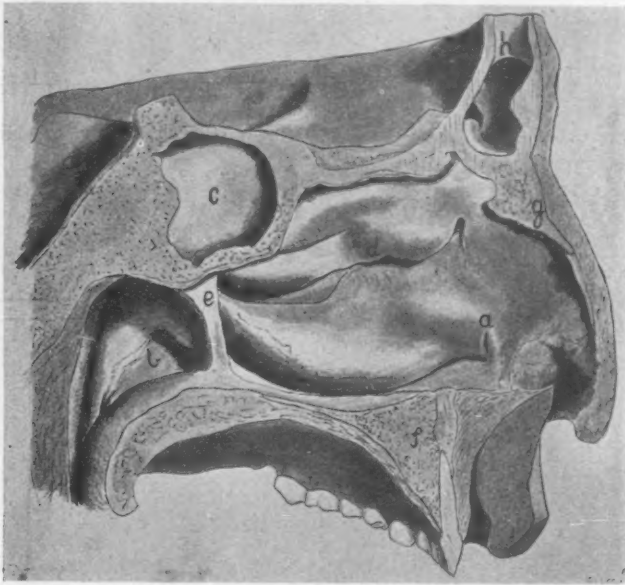


Figure 2. Lateral view of nasal fossa showing first cut at anterior end of inferior turbinate; b, Eustachian tube; c, sphenoidal sinus; d, middle turbinate; e, posterior border of septum left standing; f, hard palate; g, nasal bone; h, frontal sinus.

In order to avoid the creation of the bad stump embodying the objections mentioned and with the idea of sufficiently preserving the physiologic function of moistener of the inspired air, possessed by the turbinated body, I gradually devised the operative method here described and have employed it for several years with great satisfaction. It reduces the turbinated body to any size desired and insures covering of the cut surface by a flap. It is performed as follows:

The patient lies upon an operating-chair in a semi-recumbent position, the operator standing beside him upon the side of the turbinate to be resected, while an assistant behind the patient's head holds the nostril open with a pair of the retractors of my set of septum instruments.

This position requires a forehead lamp and that recommended is the Kirstein head-lamp, as it possesses a depth of illumination supplied by no other lamp, its rays being parallel to the axis of the operator's eyeball, giving so-called axial illumination. For this reason this lamp has been called "the shining eye," for it lights the operative field as if the eye itself were the source of light. On account of its great depth of focus it gives the bright illumination of the posterior end of the turbinate and naso-pharynx necessary for the operation. The head-mirror is not suitable for intra-nasal operations extending to the naso-pharynx, as its short focal depth causes its rays to scatter upon the close approach needed for the minute vision demanded by the work, the rearmost part of the naris being left in darkness. Then the head-mirror requires a source of reflected light incompatible with the reclining position of the patient. The depth of illumination of the Kirstein lamp is increased by the use in it of the Bruenings' miniature lamp with three crossing filaments. This lamp was devised by Bruenings for bronchoscopy.

The operative field is prepared by an application of adrenalin in 1-1000 solution by means of a small swab, the same swab moistened with the adrenalin then being dipped into flake crystals of cocain, which are rubbed into the turbinate, this, in a few minutes, becoming blanched, retracted and insensible. I have never seen intoxication from cocain when used in this way, while the local anesthesia is the greatest obtainable in proportion to the amount of cocain used, the efficiency of the drug increasing with its concentration, so that the pure drug is far more than ten times as effective as a ten per cent solution. For this reason the quantity employed is minimal.

The operation is begun by means of a small cut in a vertical direction at the foremost end of the turbinate (Figure 2) made with a small myringotomy knife (Figure 1), which, through this cut, uplifts submucously the mucosa-periosteal covering of the turbinated body on its convex inner aspect as far as it may conveniently be made to travel. The long, sharp elevator of my septum set (Figure 1, 2) is then substituted for the knife and made to complete the elevation of the covering by denuding the entire convexity of

the turbinated body to its posterior end. It is not possible to bare absolutely the bone of its periosteum, as it will not peel off, but must be cut away, for it is so closely adherent to the indentations of the rough turbinated bone that dull elevation is impossible. The raspatory of the Freer septum set is also of value in completing the denudation (Figure 1, O):

While denudation through a button-hole cut is unsuitable for the septum, it is the proper way to bare the inferior turbinated body, as perforations do not come into question there.

When the entire convex inner surface of the turbinate bone has been submucously skinned through the small cut down to the lower

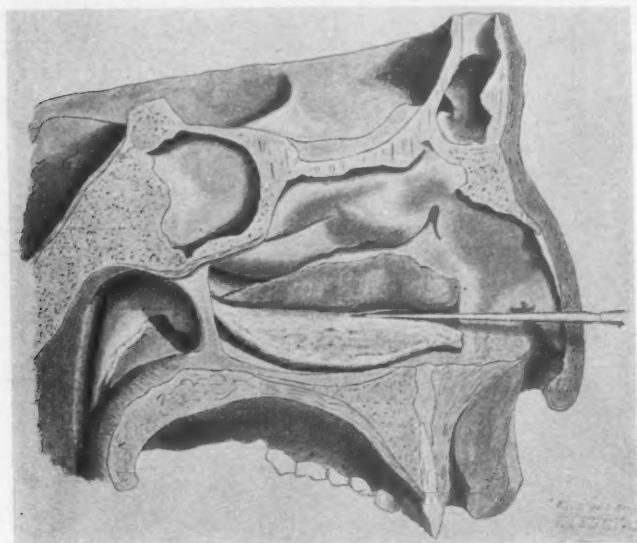


Figure 3. The chisel longitudinally resecting turbinated bone.

border and around it if possible, the uplifted covering is divided along the whole length of this border, either by cutting out from underneath through the mucosa, or, as is usually the best way, by severing it from without by cutting above and parallel to the inferior border of the turbinate upon its concave under-side down to the bone. The long elevator may then be used to uplift the remaining adherent portions of the mucous-covering of the convex side around the lower border until this cut is reached, and a flap as large as can be made released, (Figure 1), which is reflected up-

ward into the middle meatus, uncovering the convex surface of the lower turbinated bone and its lower border along its whole length. When detached, the flap always shrinks to much less than the area it had when attached to the convex surface of the turbinate, and this is the reason for making it, as described, as large as possible.

The chisel (Figure 1M) is next applied to the foremost part of the inferior border of the turbinated bone, close to its attachment to the superior maxillary bone, and driven backward with light taps of the mallet until it reaches the posterior end of the turbinate, severing the vertical portion of the bone from its more horizontal portion. When the cut in the bone has been started by the mallet, it may often be completed by merely pushing the chisel along with the hand. The chisel cuts through the covering of the concave side of the turbinate as well as the bone, this covering being sacrificed, all but the small portion above the inferior border detached by the long cut described.

When the bone is cut through it becomes loose in the nose, but is still attached by the cap-like thick mucosa of the posterior end of the turbinate. To sever this (Figure 4) the front end of the bone is seized with slender forceps and the long, sharp elevator introduced to cut around the rearmost part of the turbinated body. This procedure is the most difficult of the operation. When it is completed, the severed portion of the turbinate is suddenly released and comes out of the nose with the forceps. The flap is then replaced and will be seen to cover the stump smoothly and completely, a miniature turbinated body resulting, with no raw surface to which packing or scabs can adhere. The cutting free of the posterior end requires some strength, but the operator need have no fear of injuring the Eustachian prominence. A final inspection is then made of the rearmost part of the turbinate. If the cap-like, thick posterior end be seen to project, it must be seized with forceps and shaved off with the knife, lest it become puffed later.

The tampon used is the layer packing described in my articles on the submucous resection of deflections of the nasal septum. (Figure 5). It consists of sterilized lint (made by Johnson and Johnson) cut into strips about three-eighths of an inch wide. These are impregnated with powdered subnitrate of bismuth, soaked in oil vaseline and introduced in layers, each layer consisting of a strip folded upon itself and stretched out by means of an elevator pushed into the end of the fold, the elevator carrying the strip as far back

into the nostril as desired. Each folded strip is tamped down along the nasal floor until the packing is built up higher than the turbinate. A last long strip is then tucked in with the elevator above the others to fill the naris to its top. This packing gives perfect assurance against bleeding of any consequence, if the whole naris be filled with it. Nevertheless, no matter how firm the tampon, some oozing will take place when the effect of the cocain has passed off. Patients must be warned of this and told that it is to be expected.

Owing to the smoothness of the covered stump, the packing may often be taken out on the next day; but it is wiser to leave it in until the second day. Healing takes place by first intention.

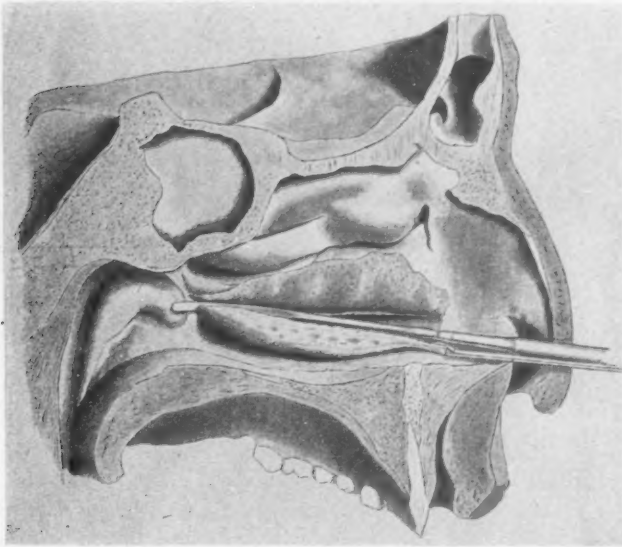


Figure 4. The posterior end of the inferior turbinate is being cut free with the long, sharp elevator.

After the removal of the packing, the patient should not use the nostril for a week, keeping it closed with a small plug of cotton. After this, for another week, he should keep it closed in the daytime, but may breathe through it at night. Then he may be allowed to use it for breathing all day.

The nostril should be sprayed, for some weeks after the operation, with a solution of borax to keep it clean and with vaseline oil to prevent the drying of secretions. When healing is complete the

resected turbinated body will appear as a miniature turbinate and cannot swell up again in an obstructive manner.

Resection of the inferior turbinated body should never be employed, as it often is, to open the naris where a deflection of the septum is the fundamental cause of the obstruction. In such cases the septum almost always must be resected later, and, if resected first, would have spared the patient the turbinate operation.

The longitudinal resection of the lower turbinate, as here advised, secures complete opening of the nostril from end to end, an opening unattainable when only the anterior or posterior half of the turbinate is removed, as is sometimes done, or when the frequent practice of merely snaring off the mucosa of the posterior end of the turbinate is followed.

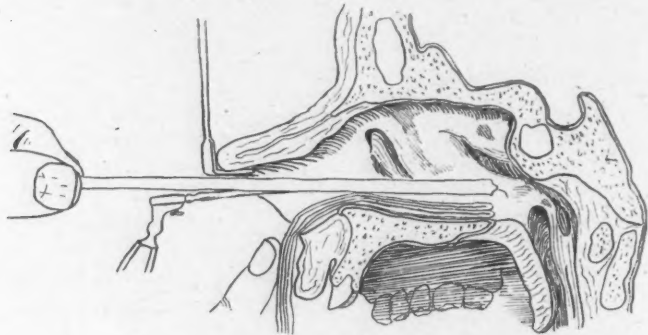


Figure 5. The insertion of the nasal tampon.

As the natural direction of the air-current is upward and along the middle and superior meatuses and roof of the nasal cavity, it is sometimes claimed that swelling of the lower turbinate does not obstruct breathing. This would, in a measure be true if intumescence of the lower turbinate filled only the space between the turbinate and septum; but the turbinate is capable of swelling to several times the size it has when retracted, and it swells in all directions, forward into the nasal vestibule, posteriorly into the naso-pharynx, and upward until it reaches the middle turbinated body, so that it may completely close a naris.

The longitudinal resection I have described here has been successfully employed by me for a number of years, and I recommend it as a tried and completed procedure.

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CYST AT THE BASE OF THE TONGUE.*

BY EDGAR A. FORSYTH, M. D., BUFFALO.

Neoplasms, consisting of lymph vessels, are a special feature in the mouth, occurring chiefly in the tongue, and are usually of an embryonal nature, as is indicated by the frequency of their occurrence in childhood and their predilection for the site of former branchial clefts. By referring to the anatomy of the tongue, we will find the dorsum is convex and grooved in the median line, forming a raphe from which a septum dips down between the muscles of the two sides. The raphe terminates behind at the foramen cecum, which is the orifice of the obliterated thyro-glossal duct. In the fetus the thyro-glossal duct extends from the middle lobe of the thyroid gland to the tongue. It seldom can be traced in the adult. The median lobe of the thyroid gland is developed as a down-growth of the epithelium from the posterior part of the tongue. The site from which this starts is indicated in the adult by the foramen cecum of the tongue. The canal thus formed is known as the thyro-glossal duct or canal of His. Its walls normally disappear, but remains of them frequently are found in the pyramidal process of the thyroid gland. Accessory thyroid glands, occurring near the median line of the neck, in the vicinity of the hyoid bone and elsewhere in the neck, are regarded as being formed by division of the pyramidal process. Furthermore, certain cystic tumors at the base of the tongue and in the median line of the neck, as well as the rare cases of median cervical fistula, result from incomplete obliteration of the thyro-glossal duct.

Cysts of the tongue are to be regarded as developmental abnormalities. Some of these cases have been discovered in post-mortem examinations of abortions or premature births. Those cases observed in fetal life were extensive in character and did not belong especially to any region of the fauces, but involved quite general attachments, and caused death of the fetus in utero. In many cases the faucial tumor occurred in connection with other deformities such as cleft palate, club foot, etc. Adami and Nicholls say cysts are not uncommon in the mouth. They find them usually of the nature of retention cysts and caused by the blocking of the duct of one or the other of the glands discharging into

*Presented as a candidate's thesis to the American Laryngological, Rhinological and Otological Society, Atlantic City, June 1. 1911.

the buccal cavity. Treeves says that cysts of the tongue are mostly retention cysts of the mucous glands of the posterior third of the dorsum of the tongue; that they are rarely larger than a hazel-nut; are well-defined, spherical, tense, fluctuating and may be translucent, painless, of slow growth and contain a clear gelatinous fluid.

Generally the cysts are covered only by a thin transparent membrane, through which appears the bluish color of the fluid.

The regions in which these cysts originate are the superficial mucous glands which are thickly clustered at the base of the tongue, the large serous glands which open about the circumvallate papillae and finally the appendages of the lingual duct, the upper part of the ductus thyro-glossus. The ductus thyro-glossus, as is well known, forms in the embryo of the canal which runs from the foramen cecum to the hyoid bone. The portion of this canal which persists varies greatly in length. About its upper portion, as Schmidt has demonstrated, are aggregated a varying but often very great number of small mucous glands; from its lower end there proceeds a series of wide and sinuous ampullae, which branch repeatedly and which may extend posteriorly behind the valleculae forward and downward to the vicinity of the body of the hyoid bone. Cysts may originate anywhere along the entire length of the ductus thyro-glossus. Schmidt has collected examples of all such forms. The position of the cyst accordingly varies. Some are superficial and elevated beneath the mucous membrane in the vicinity of the foramen cecum, or more posteriorly beneath the valleculae, in or near the median line. Others lie deeply embedded in the parenchyma of the tongue, between the fibres of the genio-glossus muscle, extending perhaps to the hyoid bone. All these cysts are distinguished by the fact that some at least of the cells which line them are ciliated. Schmidt thinks that the formation of almost all of the cysts is due to an obliteration of the excretory duct at one of such glandular appendages.

In connection with the cystic tumors of the ductus thyro-glossus, the accessory thyroid glands at the base of the tongue should be mentioned. The ductus thyro-glossus is a remnant of the deep infolding of epithelium from which is formed the unpaired upper center of development of the thyroid gland. Schmidt and Bernays reports such cases. These tumor-like formations are very rare, but eleven cases having been reported. They appear as smooth or slightly nodulated tumors of a soft and somewhat elastic consistence and covered by normal mucous membrane. They are somewhat flat, somewhat elevated, even hemispherical. Their po-

sition is generally strictly in the median plane between the hyoid bone and epiglottis and the foramen cecum. They form a transition to the accessory thyroid glands, which are situated in and near the hyoid bone in the further course of the ductus thyroglossus. These accessory thyroid glands have been observed in female patients only, and generally at about the time of puberty. With respect to the diagnosis, confusion with a cyst at the base of the tongue, which can occur only in the case of a soft tumor, may prove serious. The attempt to evacuate such a tumor by incision may easily lead to a fatal hemorrhage.

According to Butlin, cysts of the dorsal aspect of the tongue are uncommon, but several different varieties have been observed. Among the most frequent are the mucous cyst, blood cyst, cysticercus cellulosae, echinococcus and chronic abscess. Mucous cysts might be expected to occur more frequently than they do, for there are numerous mucous glands beneath the surface on the back part of the dorsum. When they do form they are generally situated behind the middle of the tongue, are single and of small size. They may attain the size of a hazel-nut or almond, but are rarely larger. The mucous membrane over them is smooth, the shape of the cyst is rounded or spherical, and its outline is well-defined. The larger cysts, unless they are very tightly filled with fluid, fluctuate, and if they are prominent enough to be easily seen are translucent. They are painless and probably escape observation until they have attained a fairly large size. Mucous cysts are more commonly observed in the tongues of adults than of children, but their occurrence is not limited to any age. They increase very slowly in size and their contents consist of a clear, viscid and heavy fluid. The development of mucous cysts may be due either to too great secretion of fluid by the glands or to obstruction of the ducts. In both cases the result is dilatation of the follicle or follicles by the secretion, and, in time, the formation of a definite tumor. The diagnosis of a mucous cyst may be very difficult. When, for example, the cyst is small or placed rather more deeply than usual in the submucous tissue, very tense and situated far back on the dorsum, it is quite impossible to be sure whether it is a mucous cyst or, indeed, to be sure that it is a cyst at all. It may be taken for a solid tumor such as a fatty or a fibrous tumor, and the mistake may be discovered only when it has been punctured. It is, however, usually more clearly defined than an abscess, and in nearly every case is situated at the back part of the dorsum. When, on the other hand, the cyst is superficial, of large

size, prominent and translucent, there can scarcely be a disease more easy to distinguish. The only diseases for which it can be mistaken are the cysts formed by *cysticercus cellulosae* and *echinococcus*. The former is almost unknown in the tongue. The latter occurs occasionally, but it lies much deeper in the substance of the tongue than the mucous cyst, and is situated more often in the front than in the back part of the dorsum. It is very rarely, if ever, translucent.

A blood cyst of the dorsum of the tongue was reported by Bryant in the forty-first volume of Guy's Hospital Reports. When the cyst was opened, blood escaped. Butlin thinks this was a mucous cyst which had been transformed into a blood cyst by hemorrhage into it, as it was situated in the back part of the tongue, the seat of election of mucous cysts. This, if a true case of blood cyst, is the only one on record.

Only one case of discovered *cysticercus cellulosae* is on record, and this was doubtful, as the report was very unsatisfactory.

Echinococcus is also a very rare cause of the presence of cysts of the tongue. It is not so uncommon as *cysticercus* and occurs in adults much more frequently than in children. It forms a single small cyst situated in the muscular substance of the tongue, and projecting on the dorsal aspect usually near the middle as a smooth round tumor; it may fluctuate but is generally so tense that in the soft textures of the tongue it is not possible to detect fluctuation. When, for purpose of diagnosis or for treatment, incision is made into it a clear fluid or pus will escape in which is seen a globular hydatid or a collapsed cyst or some of the thick, ochre-like substance which is found lining some hydatid cysts. It begins as a tiny lump not clearly cystic and gradually enlarges without pain or much inconvenience. It is impossible, when the tumor is very small, to be sure of its nature, but when it has reached the size of a nut its smoothness, tenseness, and clearly defined outline may lead one to think it is a cyst. There are no means, however, by which it can be certainly known to be a hydatid cyst.

A chronic abscess has many of the characteristics of a cyst. It is perfectly circumscribed, lies just beneath the mucous membrane, which may be perfectly movable over it, and is smooth on the surface. Fluctuation may be perceptible, if the pus is not too tightly packed, and the little tumor is not usually painful or tender. Such a tumor may, therefore, easily be mistaken for a cyst. But abscess is common in the dorsum of the tongue in front of the circumvallate papillae while mucous cysts are found behind the papillae.

Cysts are usually more prominent than abscesses, and an abscess is never translucent.

Gruenwald's "Atlas of the mouth, pharynx and nose" says neoplasms consisting of lymph vessels are a special feature in the mouth, occurring chiefly in the tongue. As a rule they appear to be of an embryonal nature, as is indicated by the frequency of their occurrence in childhood and their predilection for the site of former branchial clefts. The exciting cause of their subsequent growth is usually some form of inflammatory irritation. Three principal forms are distinguished, nodules, warts and the diffuse or cystic lymph-angioma. The rarest form of all—a real clinical curiosity and one that can be identified only by means of the microscope—is the lymphatic cyst, a smooth, hollow tumor which, so far, has been chiefly observed in the tongue.

The "Year-Book of the Nose, Throat and Ear, for 1901," mentions a case, reported by F. Powell, of a cyst at the base of the tongue in a child of 3 years. The cyst would increase in size until it became as large as a small hazel-nut and then rupture. As it occupied about the position of the foramen cecum, Butlin considered it a case of cystic dilatation of the thyro-glossal duct and advised removal with the galvano-cautery loop and cauterization of the depression.

I saw a child at the Victory Infant Home, December 22, 1909, with the following history: Polish, but known by the name of Billy White; had been at the Home about six months; during his stay there he had no sickness or any symptoms that would lead one to suspect any growth in his throat; had a very large head, and nurse said he had a peculiar, loud cry. The superintendent gave me the following history: The child had croup, or what was supposed to be croup, and she was summoned in a hurry to see him; she sent a hurry-up call to Dr. Tracy, the visiting physician, to come and see him. He examined the throat and found a growth and had me called. I went that same day and found a child of 3 years, normally developed except that the head was very large, breathing fairly well except when lying down; then he would choke and struggle for air and appear croupy. On examination, when the tongue was depressed, the tumor showed on the back of the tongue. I used a laryngeal mirror and found a large body, the size of a pigeon's egg, translucent, and fluctuating. I could see it was attached to base of tongue in the vicinity of the foramen cecum. I tried to use a snare in removing it but the sac was so

thick, the snare would not cut it off. The snare was one I have used for fifteen years or more, and constant sterilizing might have made the metal in the handle soft, because the handle bent so as to form a pronounced curve. Then I took a tonsillotome and removed the growth. There was a sac filled with thin fluid. The bleeding was very little and the child was put to bed, slept well and never had any recurrence of the strangulation, nor was there any recurrence of the cyst. The child remained well until May of the following year, when it died of broncho-pneumonia.

The specimen was given to the pathologist for examination but I regret to say he informed me that it had been lost. However, he reported that he had examined the case prior to the death of the child and found no recurrence of the cyst; that the parts were completely healed and in a healthy normal condition.

My investigations lead me to the following conclusions: That the mucous cyst is of rather rare occurrence; not very difficult to diagnose, and that permanent relief may be afforded without any special danger to the patient. Further, that the complete removal of the cyst is advisable, thereby preventing a possibility of recurrence; that incision, while affording temporary relief, does not positively prevent recurrence.

The subject is one of special interest because of the very fact that so little authoritative literature covering mucous cysts is to be found.

322 Franklin street.

Epithelioma of the Lower Eyelid and Ala Nasi Cured by Radium-therapy. J. G. DEL MAZO. *Rev. ibero-am. de Cien. med.*, Jan., 1911.

The author reports the clinical history of a woman, 54 years old, who had an extensive epithelioma. She submitted to radium treatment for eight months. The tumor disappeared, leaving only small cicatrices.

ED.

LARYNGO-ESOPHAGEAL FISTULA—LARYNGOSTOMY— CURE.*

BY JOSEPH A. WHITE, M. D., RICHMOND, VA.

I here present a case that some of you gentlemen saw two years ago in Richmond, the report of which was overlooked by the chairman of our Publication Committee, and, therefore, did not appear in our transactions. Notwithstanding this, I have concluded that it might interest some of those present who have not been fortunate enough to see so many of these cases as to look upon them as a usual occurrence. This, and my limited knowledge of and lack of experience with them is my apology for again trespassing on your time—to get some suggestion in the further treatment of this special case, the only one I ever saw.

I shall first read the short report I made to this section on February 13, 1909, under the title, "Necrosis of cricoid cartilage; abductor paralysis; subglottic abscess and stricture of esophagus; laryngo-fissure," and then make a few remarks about the subsequent history of the case.

"The patient now before you is Charles Healy, 32 years of age, who came to see me on August 27, 1908, suffering from hoarseness and difficulty in breathing. He had a scar on his neck from a former tracheotomy; he coughed up a great deal of secretion, in which were found staphylococci and pneumococci. Examination of the larynx showed paralysis of both abductors. There was a small fistulous tract extending from the tracheal scar up and outwards to the left, from which foul-smelling pus exuded. My diagnosis was subglottic abscess from caries of the posterior part of the cricoid cartilage which caused the abductor paralysis. I could not make out the cause of the caries. He gave no history of specific trouble. There was no evidence of tuberculosis, and if he had received any local injury he was not aware of it.

"He told me that in November, 1907, while employed in the C. & O. shops in Huntington, W. Va., he had a stinging pain in his throat, and consulted a physician who gave him no relief, and as his breathing became difficult and he had some trouble in swallowing he was sent to the hospital for further treatment. On November 25, his trachea was opened by Dr. Moore, who diagnosed abscess of the throat. The tube remained in for four or five days. A month later, he left the hospital for a trip East, and while away he

*Read before the meeting of the Southern Section of the Rhinological, Laryngological and Otological Society, Lynchburg, Va., February, 1911.

was laid off. He received no treatment from December 24, 1907, until April 23, 1908, but grew steadily worse, and on that date he entered the Episcopal Hospital in Philadelphia, where he remained until July 25. While there, an intubation was done by Dr. Aufhammer who discharged him from the hospital on July 25, with a certificate stating that he had necrosis of both arytenoid cartilages and paralysis of both recurrent laryngeal nerves. I found no necrosis of the arytenoids, and no recurrent laryngeal paralysis, except of the abductors. He has been a great sufferer from rheumatism but I could get no specific history. On September 5, while I was out of the city he had a dangerous attack of dyspnea, necessitating a re-opening of the trachea, which was done by my assistant, Dr. Baggarly. He remained under observation and treatment and improved steadily, but as I could not get rid of the pus from the larynx and a decided esophageal stricture had developed I opened the larynx on November 25, curetted the necrosed cricoid, found and laid open an abscess in the laryngeal wall extending upward from the cricoid cartilage to just beneath the left cord, and cauterized it with carbolic acid. I also removed a part of the vocal cord, and am sorry I did not remove both, so that he could dispense entirely with the tube. I think that if I had done so he would not be wearing the tube at present, as he breathes very well through a fairly good glottic aperture when the tube is out.

"Shortly after I operated upon him he went back to his home in Newport News, expecting to return, but he has been confined to his bed with rheumatism ever since, until within the past few days.

"You will observe that in the healing-process after the laryngofissure the left arytenoid slightly overlaps the right one, and that both are somewhat edematous. I do not know how to account for this swelling or thickening as it was not present when he went home. I shall make later a further report of the progress of this interesting and unusual case."

From the time the section meeting adjourned, he remained in the hospital until July, 1909, under local treatment, in the attempt to reduce the thickening and increase the size of the glottic opening. As very little change took place and more or less discharge was present from time to time I decided to do a second laryngotomy, and on June 17, 1909, performed this operation, removed the left vocal cord, and attempted to reunite the cartilage without the overlapping that resulted from the first operation. In this I was only partially successful. He returned to his home in July, and came back to the hospital in October, 1909.

As the laryngeal stenosis still continued to such an extent that he could not dispense with the tube, I thought that a laryngostomy, with the subsequent tube-pressure treatment might bring about the desired result. Before performing this, I suggested that he visit Dr. Jackson, in Pittsburg, and get his opinion.

He went to Pittsburg in November and remained several weeks under Dr. Jackson's observation. His conclusions are best given by quoting from a letter to me, dated November 24, 1910.

"I have been unable to determine positively the cause for the chondral abscess in Healy's case. Moro von Pirquet, hemolytic and Wassermann tests are all negative. Syphilis the most probable, seems unlikely here. I think it must have been the deep penetration of infection of the mucosa. I have seen a number of laryngeal abscesses where no other cause could be found. The question that bothered me most was whether the lumen of the cartilagenous box remaining would permit a good result from laryngostomy. I have decided that it would, but it is going to be a very tedious after-treatment. As he need not stay in the hospital more than a few days I am asking you if you cannot arrange to operate upon him in Richmond.

"I shall send him home after a few more days of study. You can do the operation as well as I can. I appreciate very much your allowing me to see him."

He returned to Richmond, in December, for a few days, and then left for his home in Newport News. After the holidays he came back and was kept under observation and treatment so as to get him into the best condition for the operation, while waiting to get the Jackson tube, for which I had to wait about two months.

On April 22, 1910, I did an incomplete laryngostomy, incomplete in as much as the posterior wall of the cartilagenous framework could not be split in the usual way, because of an obstructing complication—an unhealed abscess of the posterior laryngeal wall, starting from the cricoid cartilage and extending upwards about three-quarters of an inch, with the apex of the abscess opening into the esophagus.

If I had split the mucosa and cartilage down to the esophagus, I should have made a large opening into this tube and still further complicated matters. At least, I so concluded. I, therefore, contented myself with slitting up the laryngeal wall of the abscess, inserting the laryngostomy tube, and packing well around it so as to get as much opening as possible for removing and replacing the tube. The result you can see for yourselves. The abscess is healed,

the fistulous opening into the esophagus has closed, the lumen of the larynx has increased, and, although there is considerable swelling of the arytenoids especially of the left, I think we may safely close the external opening. This swelling will probably subside when he uses frequently the natural passages more for breathing.

However, to be sure that he can do without the tube an ingenious method of artificially closing the external opening with a plug which will prevent the passing of any air was devised. I gave Dr. Cowardin and Dr. Scales, members of our dental faculty, an idea of what I wanted, and this simple apparatus to which I call your attention, is the result.



Plate 1.

Appearance of larynx when patient was presented to section.

The patient has only had it for a few days and can remove it or replace it himself. When he has worn it long enough to leave no doubt of his ability to breathe through the natural air-passages I shall close the external opening by a plastic operation.

I think that this case presents some unusual features. Necrosis of the cricoid cartilage is rare—when present it is usually due to syphilis, and this case has never had syphilis, if our modern-day tests are reliable. Incidentally, I will add that he never was put on anti-syphilitic treatment and cured, before the tests were used. Tuberculosis also may be excluded.

He has had both vocal cords removed but has still a fairly good voice though he would not do for an opera singer. He had a partial stricture of the esophagus as well as stenosis of the larynx.

The most interesting feature of the case was the presence of the fistulous opening between the larynx and esophagus, due to a vertical abscess of the posterior wall of the larynx, which was overlooked in both laryngotomies and was only discovered when I attempted to split this wall in doing the laryngostomy.

I agree with Dr. Jackson, that the trouble was originally due to traumatism of the mucosa but not of the laryngeal mucosa as he suggested, but of that of the esophagus at the cricoid cartilage,

possibly the impaction of a small fish-bone, which resulted in ulceration, swelling, obstruction, and eventually necrosis, with paralysis of the abductors, abscess and perforation. In other words, the laryngeal trouble was secondary to, and consequent upon, the esophageal injury.

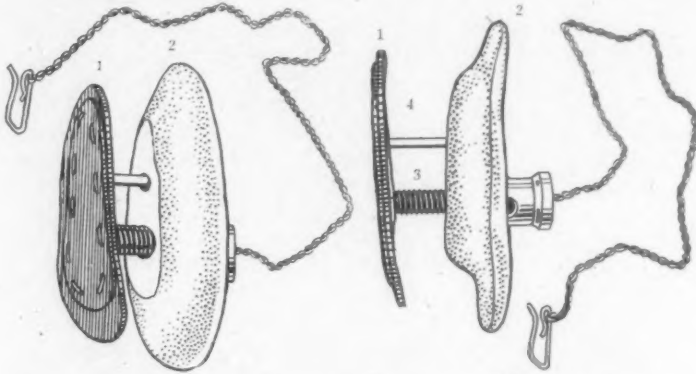


Plate 2.
Obturator for Tracheal Opening.
1. Soft rubber disk for inside of opening.
2. Hard rubber disk for outside.

Plate 3.
1 and 2 as in Plate 2.
3. Running screw for closing disks.
4. Pin to prevent turning.

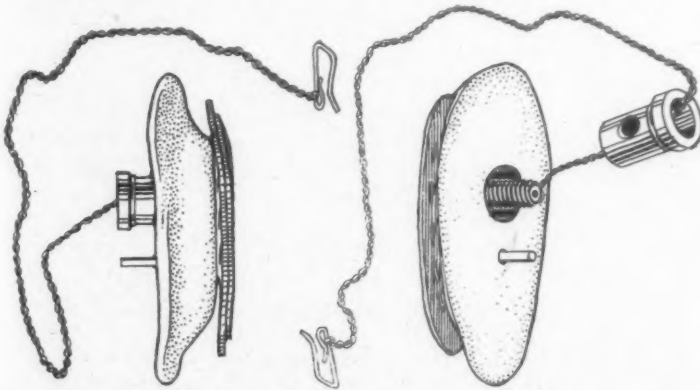


Plate 4.
View of obturator closed. Side view. Obturator in position. Front view.

In view of the history of the case, I think this the correct explanation of the trouble, but should thank any one present for a more satisfactory one.

200 East Franklin Street.

ESOPHAGOSCOPY.

BY RICHARD H. JOHNSTON, M. D., BALTIMORE.

To popularize the examination of the esophagus, simpler methods of passing the esophagoscope must be used. While the old methods are easy for a few experts, they are difficult for the less experienced and are accountable for a certain number of distressing accidents such as rupture of the esophagus, etc.

For the past two years along with direct laryngoscopy and bronchoscopy, I have been working to simplify the examination of the upper end and of the entire esophagus. The results of the experiments apply particularly to infants and children since practically all adults can be examined in the sitting position under local anesthesia. We all recognize the fact that general anesthesia makes esophagoscopy more dangerous but gives us a quiet patient. To obtain simple methods without anesthesia has been my aim. Infants and children under 6 years of age are not given an anesthetic. The little patient is pinned in a sheet so that the arms and limbs are easily controlled. The examining table is arranged with cushions for the body and head so that the head can be lowered to the plane of the table. The patient is placed flat on the cushions with the head straight as in the straight method of direct laryngoscopy. An assistant sits at the head of the table and steadies the head. The operator stands at the left and holds the modified Jackson laryngoscope in the left hand. It is seldom necessary to use the thimble since the child usually cries and opens the mouth sufficiently for the instrument which is passed straight down between the incisor teeth. When the epiglottis comes into view, the larynx can be examined if desired. To open up the upper end of the esophagus the spatula end of the laryngoscope is passed well down behind the larynx which is gently pulled up as far as necessary to open up the esophagus. By this method a stricture or a foreign body can be diagnosed and the foreign body removed in a few seconds. If a stricture is present at the upper end of the esophagus or if one desires to examine the entire esophageal tract, the following method is used: With the patient in the position above described, the pillow under the head is removed and the head is allowed to drop to the plane of the table where it is held firmly by an assistant. It is better to use a high table since the operator stands throughout the

examination and treatment. The laryngoscope is introduced as before until the upper end of the esophagus comes into view. If a stricture be present, it is quickly dilated with Bunt's bougies. If it be necessary to pass the esophagoscope, it is pushed through the laryngoscope, the eye is transferred to its end and one sees it as it passes the cricoid and slips into the esophagus. While an assistant steadies the esophagoscope, the laryngoscope is removed. The examination is now proceeded with and if the head is in the right position, the walls of the esophagus are satisfactorily examined. It may be necessary to place a small pillow under the head which does not delay the examiner. Strictures low down are easily dilated. The examination requires only a few minutes and the child is not hurt. The methods are simple and I believe better than throwing the head over the end of the table and passing the esophagoscope with the finger as a guide. I can work with more confidence when I see the different steps of an operation. Other advantages are that no trained assistants are needed and the operator stands comfortably which is better than when he is in a cramped sitting position. Simple methods of direct laryngoscopy, bronchoscopy and esophagoscopy enable us to work any time and any place without trained assistants. We are not partially dependent upon others for successful work.

A few days ago a little girl, 20 months old, was brought to me with the history of having vomited blood. The family physician feared that the child had swallowed some sharp object which might be sticking in the esophageal wall. She was examined as above described. A scratch was found on the posterior wall which was bleeding. There was no foreign body. The next day the patient had recovered her spirits and was swallowing as well as ever. Apparently the examination had not hurt her.

A girl, 2 years old, swallowed a penny which was followed by inability to eat solid food. An X-ray picture showed the coin in the upper end of the esophagus. With the head straight on the table the penny was easily seen through the direct laryngoscope and promptly removed with Pfau's forceps. The child was frightened but was not hurt.

807 North Charles Street.

A METHOD OF FILLING THE EXCAVATED MASTOID WITH A FLAP FROM THE BACK OF THE AURICLE.

BY HARRIS PEYTON MOSHER, M. D., BOSTON.

Through the kindness of Dr. E. M. Plummer, the writer has been experimenting for the last two years with a flap of soft tissue taken from the back of the auricle and placed in the bony cavity produced by the operation for acute mastoiditis. The purpose of the flap is to shorten the healing, to prevent deformity, and to lessen the frequency of secondary operations. The flap has always been used in

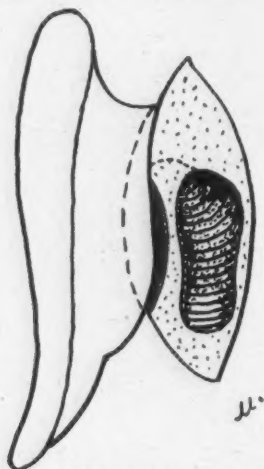


Figure 1 shows the excavated mastoid cavity. Plummer's technic consists in the taking down of the greater part of the posterior canal-wall and in extending the bone-cavity forward to the root of the zygoma below the short dotted line. The long dotted line shows the skin-incision on the back of the auricle for the removal of a strip of skin.

connection with Plummer's technic for the acute mastoid operation; that is, after the mastoid cells have been exenterated the greater part of the posterior canal is taken down the same as is done in the radical operation, the only difference being that a small bridge of bone is left external to the aditus.

The removal of the greater part of the posterior wall of the canal converts the operative cavity from a deep pocket into a superficial depression. The antrum and the aditus alone keep their complete bony boundaries and retain the characteristics of a pocket.

After the work on the posterior canal-wall has been finished, the upper anterior margin of the bone-cavity in the region of the root of the zygoma is bevelled off. When this has been done, if the surgeon will push the auricle of the ear into the wound, he will find that it is of the right size and shape to fill the greater part of the mastoid excavation. On seeing this it is hard to escape the conviction that the auricle was made in part for this purpose. Last year the writer operated a few cases by partially denuding the back of the auricle and by setting the bowl of the auricle into the bowl of the mastoid cavity. The cavity, except for the antrum and aditus, was nicely filled. The cases healed quickly and well, but the

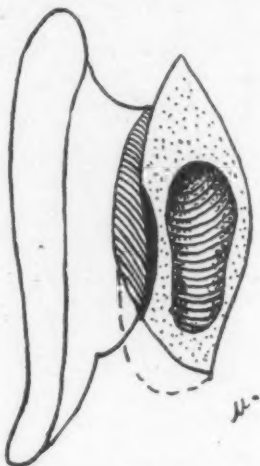


Figure 2 shows the denuded area on the back of the auricle. The dotted line indicates where the skin is undermined at the bottom of the incision in order to uncover the soft tissues which are to make the tip of the flap.

auricle was pinned back so far that in two or three instances it was held to the side of the head and caused a noticeable deformity.

Extensive denudation of the back of the auricle a quarter to half an inch was, therefore, abandoned. Instead, only a thin, semilunar strip not more than an eighth of an inch was removed. This gave access to the soft tissues on the back of the auricle and allowed them to be dissected up into a large flap. This flap, instead of the auricle, was now used to fill the excavation of the mastoid cavity. Experience has shown that it will fill the cavity even better than the auricle itself and that in addition it does not result in pulling the ear too close to the side of the head.

In order to make the flap, the operator bends the auricle forward over the tip of the left forefinger, steadying the ear with his thumb. Then a crescent-shaped piece of skin about an eighth of an inch wide is dissected from the back of the auricle. Figure No. 1 shows the line of the incision and Figure No. 2 shows the shape and size of the denuded area.

If the excavation in the tip of the mastoid is large or if the tip has been removed, the soft tissue at the base of the auricle is made accessible by undermining the skin in this region for a quarter of an inch as shown by the dotted line in Figure No. 2. In this

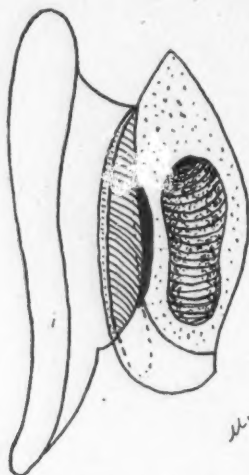


Figure 3 shows the incision through the soft tissues on the back of the auricle. The interior incision is a full line. This is continued below and behind by a dotted line which represents the tip of the flap, and the posterior incision and the posterior boundary of the flap.

region the skin is not dissected off because if this is done the lower part of the incision will not come together without considerable tension and the stitches will cut out and increase the scarring.

The next step in cutting the flap is to start an incision through the soft tissues on the back of the auricle by entering the point of the knife at the top of the denuded area just behind the skin-incision and to cut through the soft tissues until the cartilage is almost reached. The surgeon's finger which is in the bowl of the auricle tells him when to stop. When the incision has been carried as near the cartilage as possible without exposing it, the dissection is carried forward and then downward. At intervals, sharp dissec-

tion is replaced by blunt dissection as it has been found that there is a certain amount of cleavage between the perichondrium and the soft tissues of the auricle. By proceeding carefully forward and downward the flap is gradually separated. As the dissection nears the base of the auricle the flap grows thicker until at the very tip of the flap, opposite the end of the mastoid process, it measures from a quarter to half an inch in thickness. This last measurement is obtained only when the tip of the mastoid has been removed. When the dissection has reached the level of the tip of the mastoid process, the end of the flap is freed by cutting with a pair of scissors first toward the auricle and then upward. As this is done, a

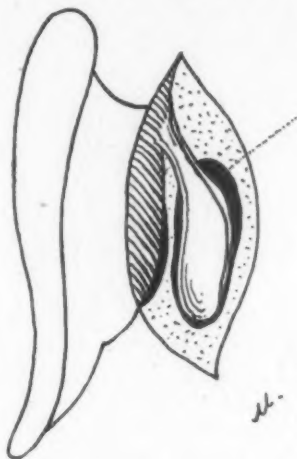


Figure 4 shows the flap after it has been completed.

vessel is severed which bleeds smartly. The writer likes to leave the shell of the excavated tip of the mastoid process in place. If this is done, the end of the flap is made to come opposite the tip of the mastoid. In those cases, however, where the tip of the mastoid process has been removed it is well to go a bit lower into the tissues of the neck because in this way the largest flap is obtained. These very long and large flaps, however, leave a deep space in the tissues which invites infection.

The size of the flaps which can be obtained in this way has varied from (to change to the metric scale) 3 cm. long, 70 mm. wide and 8 mm. thick in a baby nine months old, to 4 cm. long, 2 cm. wide and $1\frac{1}{2}$ cm. thick in an adult. Taking cases as they go,

the writer's experience so far has been that the ordinary mastoid cavity can be filled with the flap. In cases of large excavations, the flap fills up about two-thirds of the cavity.

After the flap has been cut, the wound is dried out and the tip of the flap placed in the lower part of the mastoid cavity and the body of the flap in the body of the cavity. A small wick is placed straight into the antrum and aditus close under the roof of the middle fossa and the pedicle of the flap is tucked close up under it. The wound is closed up except at the top where the wick comes out. During the suturing, pressure is kept on the flap in order to

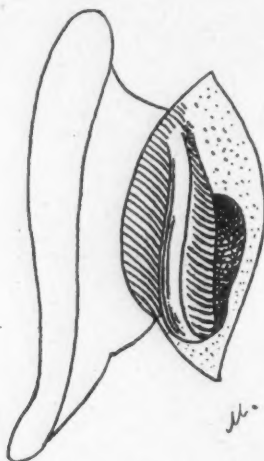


Figure 5 shows the flap placed in the excavated mastoid cavity. The dotted line indicates when the wick is inserted above the flap and carried straight into the antrum.

prevent blood-clot from getting under it. At the lower end of the incision, below the lowest stitch a small drain of gauze is inserted. This second drain is to take care of the blood in the miniature pocket left by the dissection of the tip of the flap. After a free opening of the drum, a wick is placed in the canal.

In twelve hours the lower wick is taken out and the blood and serum expressed from the lower part of the wound. The wick to the middle-ear is changed but the wick to the antrum and aditus is left in place two or three days, according to the condition of the middle-ear and the external wound. The wick to the middle-ear is changed daily and so is the wick to the lower part of the wound.

The lower wick is not left out for a week or more. In the ideal case the middle-ear is dry on the fifth or sixth day. As soon as this occurs, the temptation is to remove the drain which runs to the antrum and to let the small sinus close. Experience has shown, however, that this should not be done. This drain should be withdrawn gradually, otherwise the discharge from the middle-ear will start up again. From the twelfth to the fourteenth day the mastoid wound is a superficial granulating scar and in three to four weeks a healed linear incision.

In working with the auricular flap the writer has tried to discover its disadvantages as well as its advantages. The disadvantages so far have proved to be few. The chief difficulty is to cut the flap without perforating the cartilage and entering the canal of the ear. I have done this a few times but no ill results have followed. The second disadvantage is the danger of narrowing the lumen of the canal. No permanent narrowing of an amount which could be considered serious has been seen.

The drawbacks of the flap then are few; its advantages have proved to outweigh them. They are: The flap is made of organized tissue of a kind which easily preserves its vitality and it is taken from a locality which allows it to fall easily and naturally into its new position. The wick to the antrum is carried straight into it by using the floor of the middle fossa, or, in other words, the superior wall of the mastoid cavity as a guide. When the wick is carried up from below, beneath a partially sutured wound it is not easy to be sure of entering the antrum deeply after the first few dressings. When the flap is employed the deformity caused by the sinking of the scar is minimized or done away with altogether. The time of healing is shortened one-third or one-half. The liability to a recurrence of suppuration should be lessened because the mastoid cavity as a distinct cavity with complete bony boundaries is reduced to the small pocket comprised by the antrum and the aditus.

828 Beacon Street.

Laryngostomy for Scleroma of the Larynx. A. CANEPELE. *Monatschr. f. Ohrenh. u. Laryngo-Rhinol.*, Heft 2, 1911.

Canepele reports two cases of scleroma of the larynx cured by means of laryngostomy and dilatation. Ed.

SOME ANOMALIES OF THE MASTOID FROM A SURGICAL ASPECT.*

BY HENRY B. HITZ, M. D., MILWAUKEE.

Some eight years ago a case of double mastoiditis complicated by an inter-communicating sub-occipital sinus came under my care. Since that time I have been greatly interested in the question of anomalies or atypical conditions of structure of the temporal bone which seem to influence to some extent the course of mastoid disease. In an extended review of the literature for the past five years, I have been able to gather but little of value from an anatomical standpoint, although many of the published case-records are of intense interest from a clinical aspect. In an article published two years ago (*Archives of Otolaryngology*, 1908) Mr. Arthur Cheatele gives the result of the examination of five hundred temporal bones, with many excellent illustrations of the more instructive ones. In Mr. Cheatele's paper great stress is laid upon the close association of the cellular structure of the mastoid and the petrous portions, and of the liability of deeper involvement in the cellular types of bones from the presence of suppurative process in the mastoid. For my own satisfaction, I sought to obtain sufficient material for a careful study of the subject, but my efforts were disappointing. Some of the few bones that were obtained, however, have been sectioned in different planes and will be thrown upon the screen, as they seem to illustrate certain points of significance, taking into consideration the effects of destructive inflammatory disease and the tendency to spread along certain lines. From the dearth of post-mortem material, I have turned to my clinical records covering seventeen rather active years in mastoid surgery, and have executed from rough drawings made shortly after operation the sketches to be shown, which, however inaccurate from an anatomical standpoint will, I believe, serve their purpose. Before proceeding further let us consider briefly the question of what constitutes a normal mastoid. It is one not easily answered. We may all subscribe to the statement that the normal mastoid apophysis is a projection of bone posterior to and below the external auditory meatus, furnishing attachment to the upper end of the sterno-cleido-mastoid muscle; that, externally, it consists of a dense bone-

*Read before the meeting of the American Academy of Ophthalmology and Oto-Laryngology, Indianapolis, September 26, 1911.

structure of variable thickness closely associated with and part of the surrounding bone-mass; internally, a cellular or diploetic structure, co-extensive with that of the petrous and squamous portions of the temporal bone and of the occipital; and lined with another layer of dense bone usually much thinner. The upper area of the cellular structure contains a cavity, the antrum, that is practically constant, and in direct communication with the tympanic attic. Now the form of this apophysis and the internal arrangement of the cellular or diploetic structure is almost as variable as the types of the human race and as the ages of its individuals. In the discussion of the question of its anomalies in view of this variability of structure and form, one might seem to be taking unwonted liberty with the term. Nevertheless, as the surgical aspect of variation is one

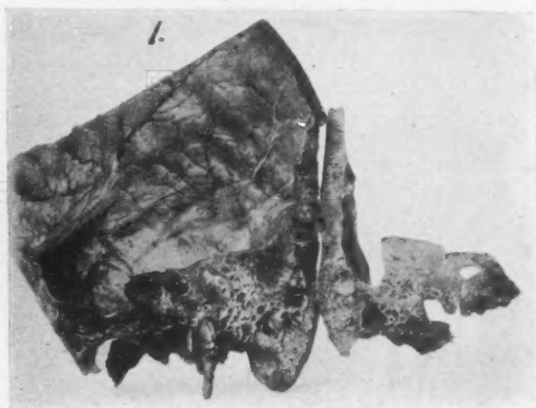


Figure 1.

of such profound importance it has seemed to me to be a subject not unworthy of your consideration. The rule that pressure developing in a septic process tends to find its way out along the line of least resistance applies no more aptly than in suppurative disease in the temporal bone, and the recognition of this dictum implies also the recognition of the possible lanes of travel and the degree of virulence of the infecting agent. Excluding the latter from this discussion, a close study of the average adult temporal bone will show certain well-defined tendencies in the mastoid development, e. g., in bones of the dense type, a thick cortex, comparatively small apophysis, with small cells deeply situated and usually closely associated with the antrum, but with certain points of vulnerability generally

upon their inner aspect. In the thinner-walled type the mastoid is generally of larger size, oftentimes containing cells of considerable area, some frequently remote from the antrum, and occasionally exhibiting breaches or extremely attenuated walls in some direction, e. g., in the digastric fossa, beneath the sigmoid knee, in the antral roof, and back along the old sutural line, the whole often in close association with the deeper petrous honeycomb. In some individuals this cellular structure will show marvelous irregularity, in others the cells are almost as regular in shape and symmetrical in their arrangement, as a package of small quill toothpicks pointing towards the antrum. Cheatle has pointed out that the development

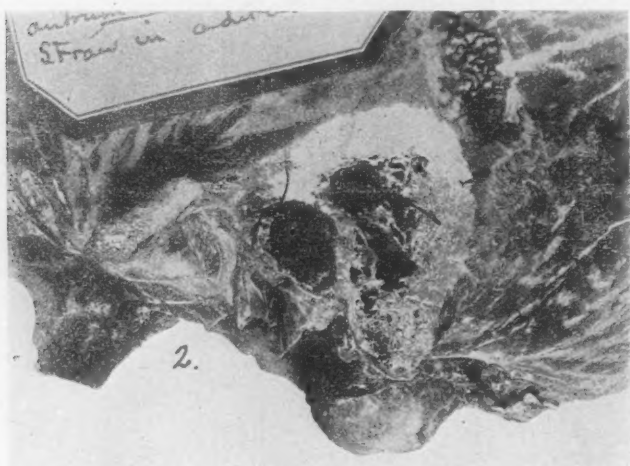


Figure 2.

of these cells originates in the antrum; hence their blood and lymph supply is largely analogous. It is a curious fact that frequently in early operations one finds septic involvement of the cells far back in the region of the emissary vein, while the rest of the structure, excepting the antrum itself is apparently untouched, and this is particularly true in the irregular type of cellular arrangement. Not excluding as carriers of infection the blood and lymph elements, by far the larger number of complications of mastoid disease is due to direct extension, the softened diploetic or cellular structure breaking down more readily than the denser bone of the two tables, so that the sutural lines or vascular openings are the vulnerable points. For example, as perforation of the cortex is probably most

frequent along the sutural line towards the apex of the supra-meatal triangle, so too are epidural lesions most frequent along the same line, from causes that are perfectly obvious.

In the matter to be presented I have endeavored to select as illustrations only those that have appeared to show peculiarity either of structure or condition which have suggested the possibility of, or which have actually developed, some complication.

1. Cross-section right temporal bone, one inch back of meatus, through apex of petrous bone, showing an extremely cellular structure with practically continuous cellular development extending from mastoid to petrous tip. This is the same bone which in an-



Figure 3.

other view shows the absence of the attic roof with a free communication into the middle cranial fossa.

2. Temporal bone of dense ivory-like character. The thick cortex is underlaid by considerable deep cellular structure which seems to radiate in whorl fashion from the antrum.

3. View of right middle fossa showing perforation of attic roof. Please note the possibility of middle fossa complications in this case. Indeed, this specimen might have suggested a pathologic process had it not been disproved by the presence of the ossicles in an apparently normal state at the time the bone was sectioned.

4. This was an attempt to show in cross-section an extremely thin attic roof in a temporal bone with a dense mastoid structure.

5. Is a longitudinal section through a dense-walled small-celled mastoid. The cut is one-quarter inch behind the meatus dividing the antrum and showing it to be practically a part of the cellular structure. There is no internal displace in this case.

6. The same bone one-quarter inch back but sectioned parallel to the last cut, showing diploetic structure external to and below the fossa of jugular bulb.

7. Longitudinal section through a thin-walled temporal bone one-eighth inch posterior to the external meatus, cutting across the supra-meatal triangle and dividing the internal auditory meatus

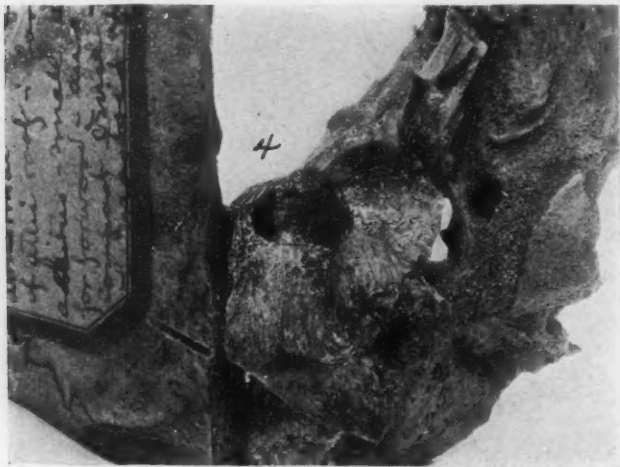


Figure 4.

lengthwise. A very small antral cavity is shown, co-extensive with the fine cellular bone-structure of the mastoid, the inner table being extremely attenuated.

8. The same bone as the last, sectioned three-quarters of an inch behind meatus paralleling first cut and dividing a large mastoid prominence in half. Each half shows a remarkably beautiful picture of the cellular mastoid type and of the petrous cells of Cheatle directly beneath the Sigmoid Sinus. The posterior part of section shows extensive cellular development to the margin of the lambdoidal suture. This piece shows also one of twin openings for emissary vessels.

9. Sketch of E. C., aged 7 years. Acute mastoiditis left ear following measles. Cortex perforated at apex of MacCuen's triangle.

Epidural pocket encountered by following a suspicious lead along masto-squamosal line.

10. Sketch of Mrs. H., aged 57 years. Acute grippal mastoiditis of unusual type. All the part shaded vertically was cancellous tissue,



Figure 5.

sue, the diploetic contents being in a state of cloudy swelling. This was completely removed. A trace of pus was encountered in the antrum. As the patient had suffered intensely and showed more



Figure 6.

than the usual temperature reaction, further search was made and soon developed the presence of the large pocket in the petrous cell, as shown in the portion shaded horizontally.

11. Acute mastoiditis. A vertical line dropped through the posterior wall of the external canal shows one-third of the apophysis

anterior to this line and directly below the external auditory meatus. The lateral sinus was exposed by the disease and lay about as shown in the sketch with the jugular bulb clearly outlined at its deepest point.



Figure 7.

12. Represents a radical operation upon a tubercular child of 2 years, who one month earlier had developed an acute infection of



Figure 8.

the left ear. Before being brought to the hospital, a Wilde's incision had been done, which resulted in a copious, thick foetid pus-discharge and a spontaneous opening anterior to the meatus and

also from the external canal. A sphacelated outer table was removed in a blanket looking not unlike diphtheritic membrane, and measuring about three inches in diameter.

13. Girl, aged 11 years. Acute mastoiditis with typical thrombotic temperature and history. Operation; Schwartz. Septic sigmoid sinus thrombosis. Primary resection of internal jugular. The sigmoid knee was exposed in MacCuen's triangle, one-eighth inch behind posterior wall of meatus, with an antrum of fair proportion



Figure 11.



Figure 9.

lying directly inward. The lateral sinus was choked with a current jelly clot. The sigmoid near the bulb was filled with a thick fetid, purulent clot. The emissary vein measured one inch in length in its passage through the bone and was thrombosed. Excepting for impaired hearing recovery was complete.

14. C. R., boy, aged 11 years. Chronic suppuration in left middle-ear of nine years' duration. Recurrent attacks of suppu-

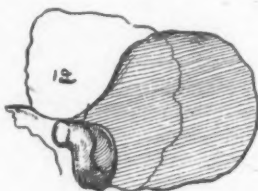


Figure 12.



Figure 13.

tion in right ear. He was brought to the hospital in a state of wild delirium, with the history of a fall, twenty-four hours earlier, which, however, had not interfered with play. Chill occurred the same night with the onset of a left facial palsy. Within the hour of his arrival radical operation was begun with resection of internal jugular and opening of sigmoid sinus. Findings: Chronic suppuration left middle-ear, cholesteatoma in antrum, and septic sigmoid sinus

thrombosis; the lateral sinus being the horizontal axis of a large epidural abscess. Death three weeks later was shown by autopsy to have resulted from spinal meningitis due to the rupture downward into the spinal canal of a half-suspected, but unlocated deep-seated cerebellar abscess. One other feature of this case brought out at the autopsy was the presence of a small area of septo-plastic meningitis around the internal auditory meatus which probably developed by extension along the Fallopian canal at the time that the facial paralysis occurred, and from which point undoubtedly the

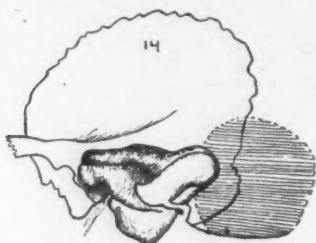


Figure 14.



Figure 15.

deep cerebellar process began; the autopsy showing that the region operated upon was rapidly progressing to recovery.

15. This might be designated as a reasonably normal type were it not for the unusual feature of the exposure of the facial nerve for

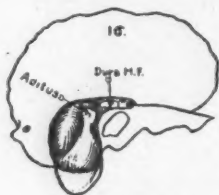


Figure 16.



Figure 10.

a distance of one-quarter inch within the apophyseal cavity at the site designated. This was positively determined by the effect of repeated irritation with the characteristic facial reaction. Fortunately no palsy resulted.

16. The only unusual feature of this case was its development in a young married woman during an apparently mild attack of grip, with very trivial acute middle-ear symptoms accompanied by a small amount of purulent discharge. The individual in question during the time never experienced pain and but little physical discomfort

aside from deafness. The range of temperature taken thrice daily by a competent nurse was between 98° and 99° . At the end of three weeks from the onset of the attack, and after she had apparently entirely recovered, a swelling appeared forward of the tragus. The mastoid was immediately opened and was found to be completely exenterated and filled with flabby granulations. The cortex had spontaneously perforated at the point indicated in the zygomatic region, and the dura of the middle fossa was found laid bare by the disease.

17. Record-note says this is the largest cavity I have seen. It has the additional unusual feature of a separate pocket in the petrous cell, not unlike a previous sketch, with the exception that the apophysis in this case was completely exenterated by the disease



Figure 17.

and was separated from the secondary cavity by a fairly thick, hard bone from which, however, at one point a lead exuding pus indicated its presence.

18. The pre-operative diagnosis was sub-acute mastoiditis plus a probable epidural abscess. Male, aged 25 years. This diagnosis was based upon the history of continued pain at a point far back of the auricle, headache, mastoid tenderness, copious sanguino-purulent discharge from the meatus, but particularly upon the presence of choked disk. At the time of operation there was no evidence in the mastoid of backward extension, but exploration along the old sutural line in the direction of the site of pain uncovered a large pocket of pus under considerable pressure at the point indicated in the sketch.

19. Acute mastoiditis (right) plus brain abscess; operation; recovery. (Temporo-sphenoidal lobe.) Three weeks before mastoid

operation the patient had submitted to some minor pelvic procedure, and subsequently developed a severe attack of grippe with involvement of both middle-ears and the right mastoid. Operation for mastoiditis was done on the fourth day of the disease. The apophysis was completely infiltrated with pus, but no cellular destruction had occurred. Bacteriological findings: Streptococci in the right ear; staphylococci in the left ear. The only peculiar feature in this case was that in opening into the antrum through the supra-meatal triangle, a cavity was encountered filled with pus, under some pres-

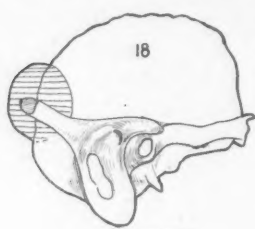


Figure 18.

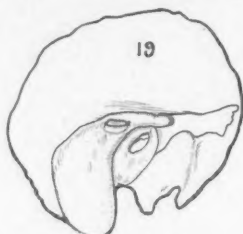


Figure 19.

sure. A bent probe inserted in the proper direction entered the aditus, but upon being rotated upwards and backwards, touched the denuded dura at the site of the antral roof, as is indicated in the sketch. The apparent absence of the antral roof was probably not due to the disease as the attack had not existed sufficiently long to lead to any cellular destruction in the apophysis. It was clearly

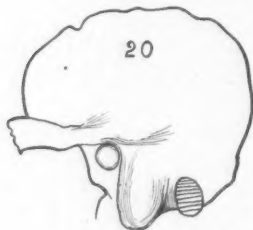


Figure 20.

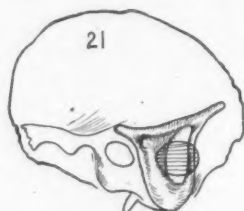


Figure 21.

not due to operative interference, as it was in a region sufficiently remote to justify this assertion. It is my belief that there was a pre-existing absence or excessive thinness of the inner table not unlike one of the anatomical specimens exhibited here. The exposure of the dura in mastoiditis is not necessarily a matter of any particular consequence, but in the case at issue the concurrent de-

velopment of a temporo-sphenoidal abscess opens up the question of whether this was not the probable path of invasion. I might add that the organism from the brain-abscess operated one week later was identical to that in the right mastoid, viz., streptococci. This case will probably be reported in detail.

20. One of the three similar cases operated at an early stage of the disease where the only focus of destruction was at the cite indicated directly beneath the sigmoid knee. There was pus in the middle-ear and also in the antrum. Pain was most marked over the focus mentioned. A very cellular mastoid seemed to entirely escape the infection.

21. Miss K., aged 52 years, operated two years previously for right-sided mastoiditis. She was brought last April to the Columbia hospital, with an acute otitis media of the left ear. The symptoms were unusually mild, afebrile and free from mastoid pain or tenderness. At the end of three weeks the condition had so far improved as to permit of her discharge from the hospital. The night before she was to leave following a chill, the temperature rose to 103° and a fraction with the development of a point of tenderness in the region of the emissary vein. The mastoid was promptly opened and a small focus of disease as indicated in the sketch was encountered directly below the knee of the sinus, the vein being bathed in pus at this point. The rest of the bone seemed free from inflammatory change. There was apparently no indication of a clot in the vein and it was not opened. Her condition steadily improved for three weeks when she developed a phlebitis in the left leg, and one week subsequently in the right. Recovery finally resulted, with no other symptoms.

309 Goldsmith Building.

On Recurrent Enlargement of the Salivary Glands. D. M. GREIG.
Edin. Med. Jour., Jan., 1911.

The intermittent swelling of the salivary glands was due to faulty secretion in the glands, sialolithiosis, fibrinous sialodochitis, primary xerostomia, pressure of a hard bone, calculus, ulceration, stomatitis, and causes depending upon the glandular function, though at present not definable.

ED.

A SYMPTOM OF MASTOIDITIS.*

BY HENRY A. ALDERTON, M. D., BROOKLYN.

The average case of mastoiditis offers very little difficulty in the way of diagnosis; the indications being so evident that the merest tyro in otology recognizes the condition.

Beyond this region of certainty there is a middle field which is misty to the beginner or to the general practitioner but which to the trained otologist is familiar ground. Some one symptom or group of symptoms, more or less obscure in themselves, indicate with considerable certainty the nature of the trouble and the necessity for intervention. Such symptoms, for instance, as drooping of the posterior superior wall of the external auditory canal in the neighborhood of the drum-membrane; the persistence of a profuse, thick, purulent discharge; the existence of a deeply congested and bulging drum-membrane, notwithstanding extensive incision, associated with or without a profuse purulent discharge; the presence of a continuous throbbing tinnitus, which remains unabated after adequate incision and irrigation; the involvement of the deep cervical lymphatic glands anterior and posterior to the attachment of the sterno-cleido-mastoid muscle; the localized tenderness at the posterior edge of the base of the mastoid process over the site of the emergence of the mastoid emissary veins; the occurrence and continuance of a slight febrile movement, day after day; the depreciation in the general health, a slight or moderate malaise, accompanied by a coated tongue and odorous breath; the character of the infective agent, whether mild or virulent, the presence of a pulsating light reflex on the pus exuding from the perforation in the drum-membrane; lastly, possibly, the evidence in the differential blood-count of an increase of polymorphonuclear percentage above eighty or an increasing percentage as contrasted with a lesser degree of increase in the leucocyte count, this becoming more evident in successive examinations.

Finally there are a certain number of cases which puzzle even the most expert otologist. These cases may have only a slight discharge, which, however, keeps up unduly long considering the apparently moderate involvement of the middle-ear structures; or the drum-membrane may heal without returning quite to its usual normal appearance, the hearing remaining poor; there may be no

*Read before the meeting of the American Otological Society, Atlantic City, June 27, 1911.

evidence of a febrile movement nor any complaint of aching nor pain around the mastoid or in the depths of the ear, except at certain periods for a short time, especially at night; or there may be no tenderness on pressure or no confession of tenderness; no bulging of the drum-membrane nor of the posterior-superior wall of the external auditory canal near the membrane. Sometimes there is complaint only of a dull ache over the affected side of the head. In these cases the throbbing tinnitus may and often is present but is not much emphasized, questioning at times being necessary to elicit the presence of the symptom. The general health may not seem to be affected. Frequently, however, after consent has been given to operation, the patients will confess to a subconscious knowledge that something was wrong; often the patient confides to the house surgeon that he or she has no pain, feels all right and does not see any necessity for operation, only consenting because of confidence placed in the attending surgeon. And, occasionally, it is only on the appearance of external swelling that the otologist wakes up to the fact that the disease process has been steadily advancing during all this quiescent period.

Now it is just in these cases of doubtful diagnosis, though present as well as a rule in the other more evident cases, that the symptom to which the writer would like to draw attention is often present and of great value as corroborative evidence.

This symptom consists in a blurring of the outline of the mastoid tip as contrasted with that of the healthy side. The edges of the tip of the affected mastoid process are not so well defined as they are on the opposite side, or when both sides are involved, as they should be normally. This blurring of outline is quite distinct from any localized swelling such as precedes a perforation of the mastoid cortex in the formation of a sub-periosteal abscess or a case of Bezold's mastoiditis. It may be the precursor of either of these conditions or it may occur when there is very little chance of either occurring.

The symptom is elicited by grasping the tip, anteriorly and posteriorly, between the fingers of one hand while exercising a control with the other hand on the healthy tip of the other side; the difference in definiteness of outline is then easily appreciable. The writer has had house surgeons and assistants, not knowing which was the involved ear, make out the affected side by this method alone. And in a large number of cases of acute mastoiditis, the presence of this symptom in conjunction with the existence of an acute middle-ear suppuration has determined operation, though the

patient was apparently progressing as favorably as usual; and in every case the operative findings have confirmed the value of the symptom as an important indication for operation. It goes without saying that a negative finding has not the importance attached to the positive. The symptom is more difficult to elicit in fat or in very muscular people than in the thin and flabby. Of course, where both sides are affected, the element of experience and tactile sensibility on the part of the observer comes especially into play, and in these cases one may be misled more easily than in unilateral cases; while the swelling from otitis externa sometimes leads to doubt, this latter is almost always reduced in a few days by local treatment and the use of the ice-bag, upon which event the presence of the above-mentioned symptom becomes manifest if an acute mastoiditis exists.

The blurring of the outline is, of course, due to a mild inflammatory infiltration of the periosteum of the mastoid tip and of the adjacent soft structures brought about by their juxtaposition to the underlying inflamed bone and seemed in most of the writer's cases to involve the entire periosteal lining of the mastoid process. The soft parts over the mastoid are more boggy than those over the unaffected side; this boggiess is at times sufficient to render the posterior auricular fold slightly less well defined on the affected side. But even where this boggiess is not apparent to the eye, the experienced hand will often detect the presence of the blurring of outline of the mastoid tip, the symptom on which the writer wishes particularly to lay stress, especially as occurring in cases of acute mastoiditis.

142 Clinton Street.

The Force Used in Removal of Adenoids. JULIUS SYZMANSKI.
Jour. of Ophth. and Oto-Laryngol., Oct., 1911.

Desiring to gauge the force used with the Gottstein, Beckman and Stubbs instruments in the removal of adenoids, the author used a Columbia spring scale upon the pan of which the pressure of the instrument is exerted and the force measured in pounds noted on the dial. The force used varied between one and ten pounds in the hands of a dozen different operators.

STEIN.

THE SIGMOID SINUS AND THE JUGULAR BULB IN INFANCY.*

BY WILLIAM C. BRAISLIN, M. D., BROOKLYN, N. Y.

A structural weakness of the parts of the skull immediately adjacent to the ear with its consequent lessened resistance to the invasion of infections, is a characteristic of early infancy. In infants, there is also a greater accessibility of the parts of the ear and surrounding structures to operative procedures for their relief.

In infants up to the age of 5 years or more, the common occurrence of edema and sub-periosteal mastoid abscesses in a large proportion of cases of mastoid inflammation is due to the superficial situation of the mastoid antrum in these young subjects.

The more ready accessibility of the ear-structures in infants also applies to the sigmoid portion of the lateral sinus and the jugular bulb, partly by reason of the lesser density of the bone covering it.

Thus the jugular bulb of the new-born is of much less actual depth, due to the small size of the cranium. It is also worth notice that its intra-cranial opening (the jugular foramen or foramen lacerum posterior) is really more exteriorly situated, relatively, than in the adult. The sigmoid portion of the lateral sinus, as it passes downward and inward across the temporal and occipital bones, proceeds a relatively less distance, in the infant, before passing forward into the jugular foramen. The passage of the vessel formed by the junction of the lateral and inferior petrosal sinuses, from within the cranium outward is quite directly forward and slightly downward, and lacks the tortuosity and much of the bulb-like enlargement of the same structure in adult life.

The intra-cranial opening of the jugular foramen in the infant is situated about midway between the rim of the foramen magnum and the periphery of the cerebellar fossa (about one-half inch in either direction), and externally at the like relative position; while in the adult, the (intra-cranial) jugular foramen is more medially situated, and its course through the bone is more outward than in the infant, so that at its point of exit into the internal jugular vein its relative position compared with the infant, is es-

*Read at the Meeting of the American Otological Society, Atlantic City, June 26 and 27, 1911.

tablished. The great post-natal development of the mastoid portion of the temporal bone seems to account in great part for this difference in infancy and adult life.

Owing to the somewhat different course of the internal jugular vein through the bone-structure, its exposure in very young subjects is never accompanied by the need for disturbing the transverse process of the atlas, since even at its point of greatest depth the outer extremity of this vertebra is still medially situated in relation to the jugular bulb.

The facial nerve overlies the bulb as in the adult. From the point where the Fallopian canal turns downward after passing

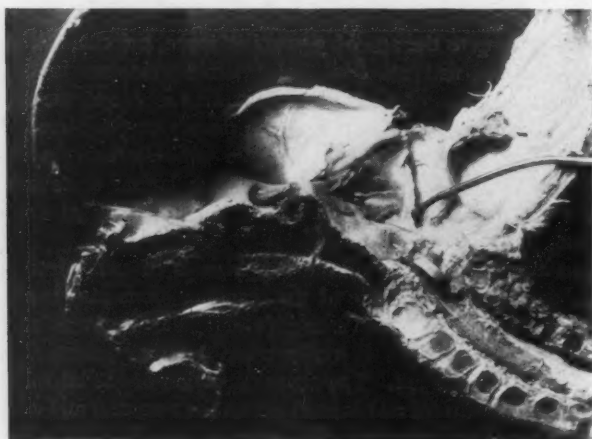


Figure 1. Medial vertical section through skull and cervical vertebrae of new-born. Parietal bone removed. Lateral sinus laid open. A silver probe bent slightly downward enters and passes through jugular vein and bulb. In the adult the passage is tortuous and irregular, so that the probe does not pass.

above the foramen ovale, its course is more backward than in the adult. In the new-born the distance from above the foramen ovale to its exit on the surface of the skull is only one-half to one-eighth inch. In the adult it is three-quarter inches or more. In this distance the facial nerve in the new-born follows a course of nearly forty-five degrees from the vertical. It emerges from the skull one-quarter inch behind, three-eighths inch below and about one-half inch actual distance from the bony tympanic ring.

In reaching the jugular bulb in the young infant no bony floor of the auditory canal exists to be cut away and the vessel in its

course through the bone does not extend as far anteriorly. The bony base of the cranium of the new-born is thinner and the vessel in its forward and downward course emerges rather posteriorly to the tympanic floor. In the infant, during the first months at least, exposure of the sigmoid sinus may be carried downwards to the jugular bulb and its posterior portion may be exposed with less difficulty than in the adult.



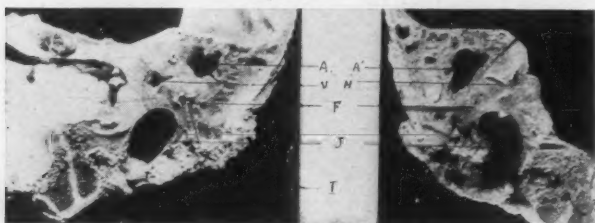
Figure 2. Transverse vertical section through skull of new-born; left side in a plane one-quarter inch more anteriorly to right. J, jugular bulb at its greatest diameter. J' lateral sinus turns forward into jugular vein. L L lateral sinus. T transverse process of atlas. M. Medulla and pons. Facial nerve emerges one-eighth inch anterior to plane of this section at F.



Figure 3. Transverse vertical section through temporal bone of new-born, same as in preceding figure, but on left side a section has been made in a plane parallel to last, one-quarter inch anteriorly. S. Superior semi-circular canal. H. Horizontal semi-circular canal. F. Facial nerve. T. Tympanic cavity. B. Jugular bulb, anterior expanded portion.

The chief differences noted between the sigmoid sinus and jugular bulb of the new-born and the adult are, viz.: In the infant the sinus is straighter and relatively as well as actually shorter, the interior jugular vein perforates the bone more directly, with less tortuosity, it is more readily accessible and hence more easily cleared. There is apparently, as noted above, little difference in the size of the right and left bulbs in the new-born; though in the five-year-old child the difference between right and left may be

established to as great an extent as in the adult. Up to 5 or 6 years the styloid process is merely a cartilaginous tubercle. The difference in the direction of the facial nerve in the new-born and adult is due to the rapid post-natal development of the mastoid portion of the temporal bone. After birth this is rapidly built up around the nearly vertical portion of the facial nerve. In other words, the course of the facial, as it is found at birth, remains, but the process of development of the mastoid by the superposition of



Figures 4 and 5. Transverse vertical section through right temporal and occipital bones, both surfaces of section shown. Figure 4 shows the smooth dura covering posterior surface of left petrous and basilar portion of occipital bone (in white). The darker portion is that cut by saw passing through wide portion of jugular bulb. J. Opening beneath I into internal jugular vein. F. Facial nerve continuing downward. V. Vestibule and non-ampullary opening of horizontal semi-circular canal. A. Aditus and (Figure 5) A'. Mastoid antrum. H. Horizontal semi-circular canal, to right of which is seen conjoined horizontal and superior semi-circular canal and below ampullary end of posterior semi-circular canal. In Figure 5 the lateral sinus enters from behind into the jugular bulb near its lower portion.

bone to form the mastoid tip and the bony floor of the meatus lengthens the Fallopian canal in its nearly vertical portion only.

The points of difference in the jugular bulb and neighboring regions of infancy and adolescence worthy of the surgeon's notice are: 1. The simple and more direct course and form of the sinus and vein. 2. The practical equality of size of both bulbs in the new-born. 3. The course of the facial nerve, overlying the bulb as at subsequent years, but passing diagonally backward as well as downward through the mastoid.

556 Washington Avenue.

SPECIAL EDITORIAL DEPARTMENT

LARYNGEAL, BRONCHIAL AND ESOPHAGEAL ENDOSCOPY.

EDITED BY
CHEVALIER JACKSON, M. D.,
PITTSBURG, PA.

THE DROWNING OF THE PATIENT IN HIS OWN SECRETION.

When tracheal and bronchial secretions are in excess of the amount required properly to moisten the inspired air they become a menace to life unless removed. Under almost all circumstances the normal activities of the cough-reflex, forced expiration, and ciliary action remove these secretions. There are certain circumstances, however, under which these normal agencies are inefficient. Various drugs, especially anti-bechics, hinder the action of the normal agencies; hence should always be avoided. The writer has always opposed their use in all laryngeal and tracheal surgery and in bronchoscopy. Doubtless many of the post-anesthetic pneumonias in surgery remote from the air passages have been due to the abolition of agencies by which secretions are normally removed from the air passages. Perhaps the most frequent operative etiologic factor in the failure to rid the air passages of secretion is age. An infant cannot expectorate and is surprisingly inefficient in getting secretions out of air passages even as far out as the laryngo-pharynx. Adults as well as children when dying often fill up with secretions which they are too feeble to expectorate, and in some instances by the failure of the respiratory blood-changes drowning is the final mechanism of mortality in death primarily due to disease remote from the air passages. The complex physiologic co-ordinated mechanism by which secretions are normally removed are too lengthy to be entered upon here; but disturbances of laryngeal motility and in the author's experience bilateral cadaveric paralysis especially are frequently associated with the condition which the writer has termed the "drowning of the patient in his own secretion."

One of these cases seen many years ago at the Western Pennsylvania Hospital with Dr. Clarence Ingram was an excellent illustration. A woman, aged 40 years, was dying of general lymphosarcomatosis. Pressure from the mediastinal or cervical neoplasms produced a bilateral cadaveric paralysis. The level of the frothy fluid could be seen rising and falling first in the main bronchi then higher and higher in the trachea until the level of the upper laryngeal orifice was reached. The woman could not expectorate. Had she not had other conditions and lesions, it would have been easy to have prolonged life indefinitely so far as drowning was concerned by the bronchoscopic aspiration of the fluid. The author has done this in other cases with the result of saving the patients. Before the days of bronchoscopy, he did a few tracheotomies for this purpose with excellent results; secretions could then be readily removed by a nurse trained in tracheal work—secretions that could never have been expectorated. In children, Dr. Boyce's method of assisting expulsion of tracheo-bronchial secretion by holding the child up by the heels has often proved efficient and has tided over a dangerous period. Perhaps the most important class of cases is those in which the secretions due to traumatism of a foreign body in the lower air passages gradually accumulate and asphyxiate the patient. One of the only two tracheotomies done by the author for dyspnea after the removal of the foreign bodies, would not have been needed had he known what he has since discovered, namely that children feeble from prolonged carbonic acid toxemia will in some instances and after certain kinds of foreign bodies, fill up with tracheo-bronchial secretion and will die if not relieved. It would seem that some of the instances reported by various writers in which children have died in an unexplained way after the removal of foreign bodies may be accounted for in this way. The condition was first pointed out to the author a number of years ago by Dr. Ellen J. Patterson. Perhaps the best case to cite as an illustration is the following:

John K., aged 6 years, referred to the author by Dr. Wagner of Johnstown, Pa. Prior to coming under the care of Dr. Wagner, the child had gone through the usual treatment by antitoxin and quarantine for a croupy cough with temperature elevation, due to a beech-nut hull, which had been cast about in the trachea and bronchi for three weeks. A grayish appearance of the skin due to dyspnea favored the diphtheritic diagnosis. The beechnut hull and a large quantity of secretion were removed at the Presbyterian Hospital by

bronchoscopy. That night the patient became extremely dyspneic and cyanotic. Bronchoscopic removal of a large quantity of thick viscid secretion gave complete relief. There was a less severe recurrence of the symptoms the next night but the child had then rallied enough to rid itself of secretions which were moreover less tenacious. The child made a rapid recovery.

There have been twelve of these cases in the practice of Dr. Patterson and the author. In some, the aspiration of secretion was sufficient; in two instances the administration of oxygen through the bronchoscope after the removal of the secretions saved life. For this the bronchoscope with the anesthetic attachment of Dr. T. Drysdale Buchanan was found very convenient as it permitted of the slightest possible interruption of the flow of oxygen during the removal of secretions by swabbing. In one instance the swelling of the mucosa, in other words the serous exudate into the mucosal tissue, prevented the pulmonic interchange of gases; the oxygen passed down through the bronchoscope could not be taken up and the child died. This was a case of influenzal tracheo-bronchitis complicated by pneumonia. It was not a foreign body case. In one instance the secretions of an influenzal tracheitis were so gelatinous as to require removal with forceps. In some of the cases the secretions were too viscid to be drawn through any form of tubal aspirator and swabbing was required.

Bronchoscopy for the relief of patients threatened with drowning in their own secretions is a new and important field of usefulness for the bronchoscope as an aid to general medicine and surgery.

The Best Prophylaxis Against Aspirating Pneumonia After Extensive Operations on the Tongue or in the Mouth or Pharynx.

A. CECI. *Bull. d'Oto-Rhino-Laryngol.*, April, 1911.

For eight days Ceci does not feed his patients through the mouth, not even permitting them to drink a drop of water. Nourishment is given by means of clysmas. In this way Ceci successfully operated ten patients. By his former methods his mortality rate was fifty per cent.

Ed.

IN MEMORIAM

On November 12, 1911, another of the active pioneers in laryngology, the Nestor of the Third International Rhino-Laryngological Congress, and an active worker in the clinical and literary fields of laryngology, Prof. Bernhard Fraenkel, of Berlin, passed away.

Bernhard Fraenkel was born at Elberfeld, November 17, 1836. He studied medicine at Wuerzburg and Berlin, receiving his degree of doctor of medicine in 1860. His pathological training he obtained with Virchow and his general medical experience at the Augusta Hospital in Berlin.

Fraenkel entered the field of laryngology during its most conspicuous epoch-making period, viz.: the discovery and practical application of the laryngoscope by Tuerck, Czermak and Garcia.

During his long period of service in laryngology, many questions of growing interest occupied his energies. Special mention may be made of his investigation in reflex neuroses of nasal origin, pachydermia laryngis, carcinoma of the larynx, paralysis of the recurrent laryngeal nerve and the minute anatomy of the larynx.

He was a liberal contributor to encyclopedias and year-books, and his monographs are valued for their exhaustive presentation, good literary style and scientific merit; he always kept in mind the relations of laryngology to general medicine and persistently emphasized the importance of this inter-relation.

As an organizer he was no less able than as a contributor to laryngological literature. Fraenkel was the first to establish a rhinolaryngologic clinic at a German University in 1887; thus giving to laryngology an independent recognition as a legitimate specialty. He was the founder of the Berlin Laryngological Society, one of the first organizations of specialists in this field.

Perhaps the most important achievement in Fraenkel's career was the founding of the *Archiv fuer Laryngologie und Rhinologie*, in

1894, a journal which, with its first issues established the highest standard of literary and scientific excellence which it has maintained to this day through his indefatigable energies.

A leader in the campaign against tuberculosis, his labors in this field have been largely responsible for the organization of the International Tuberculosis Congress which has done so much to stimu-



late not only the scientific world to more energetic effort, but also to educate the public at large in methods for the prevention of the white plague, the care of the afflicted, their segregation and all hygienic and scientific precautions in which municipality, state and nation can participate. At the Washington meeting of the International Congress on Tuberculosis, Bernhard Fraenkel was the honorary president.

He held rank as Honorar Professor Ordinarius at the University of Berlin; Professor Ordinarius at the Kaiser-Wilhelm Academy; Geheimer-Medizinalrat, Member of the Prussian Medical Council and of the Royal Academy of Science.

He was President of the Berlin Laryngological Society, the German Laryngological Society and a member of the German Central Committee and International Society for the Prevention of Tuberculosis.

The Third International Rhino-Laryngological Congress which convened in Berlin in August of the present year, was called to order by our late venerable colleague, Bernhard Fraenkel, its honored president.

We met him on this occasion and found him, in spite of his advanced years, full of energy, bright in mind and alert to every new idea promulgated at this auspicious Congress. The laryngologic world honors this man for his unceasing and untiring energy in the interests of progressive laryngology; values his scientific work and research for its genuine merit; appreciates his editorial genius in founding the *Archiv fuer Laryngologic und Rhinologie*; respects the long years of indefatigable work and fruitful literary production.

THE LARYNGOSCOPE, through its editor, its entire editorial staff, its active contributors and many readers on both sides of the water, offers this slight tribute as a token of respect to Bernhard Fraenkel, and respectfully offers its sympathy and condolence to the bereaved family.

M. A. G.

SOCIETY PROCEEDINGS.

HUNGARIAN MEDICAL SOCIETY, BUDAPEST.

RHINO-LARYNGOLOGICAL SECTION

First Session, February 28, 1911.

PROF. A. ONODI, CHAIRMAN.

Two Operated Cases of Fronto-ethmoidal Mucocoele. By M. PAUNZ, M. D.

In both cases, that of a man 38 years old, and one of a girl of 26 years, a tumor the size of a hazel-nut, fluctuating, covered by intact skin, developed at the inner angle of the right eye. Nasal cavities normal in both cases. After an exploratory incision had demonstrated an undoubted dilatation of the frontal sinus, the Killian radical operation was performed in both cases. The healing was complete. On the strength of his hitherto operated cases, in which there had always been evidences of inflammation in the frontal and ethmoidal sinuses, Paunz thinks it would be better to use, instead of "mucocoele," the name suggested by Killian, "chronic frontal sinusitis with dilatation."

Laryngitis Submucosa Acuta Hypoglottica, with Suppuration—Typhoid Origin. By M. PAUNZ, M. D.

A man, 21 years old, sick from November, 1909, to January, 1910, with abdominal typhoid, complicated with inflammation of the lungs. In the beginning of the disease there was hoarseness, later difficulty in breathing. Paunz saw the patient for the first time on February 18, 1910. Beneath the slightly reddened vocal cords, on the right side was a roundish swelling covered with inflamed mucous membrane, which narrowed the lumen of the larynx to two-thirds millimeters. Difficult breathing, cyanosis. Positive widal reaction. Diagnosis—laryngitis submucosa acuta, probably abscess. Paunz made a low tracheotomy, into which the abscess burst. As much pus flowed from above as through the tracheal opening. Later, intubation, then dilatation with drainage tube. Cannula removed in October, 1910. No trouble since that time. Breathing free, with good movement of the vocal cords.

In abdominal typhoid, catarrhal laryngitis is a common occurrence. Ulceration and perichondritis are also not rare. Simple acute submucous laryngitis with suppuration, occurs, though seldom, and is generally not recognized at the proper time. The quickly performed tracheotomy saved the patient's life in this case.

DISCUSSION.

DR. L. SINKO said that the patient is now in Dr. Morrelli's department, and is being intubated with O'Dwyer's tube No. 15. It is hoped that he can soon leave the hospital without the cannula. The vocal cords are still thickened, movement sluggish.

Case of Tele-angiectasis of the Mouth, Pharynx and Larynx. By DR. J. SAFRANEK.

In a man, 26 years old, the dilated veins of the skin of the right half of the face and of the side of the neck appeared like bluish prominent cords. On the under-surface of the tongue the visible dilated veins are on both sides as thick as a quill-pen, on the dorsum of the tongue, near the tip, the dilated blood vessels form a varicose area the size of two beans; on the right side of the soft palate the dilated venous plexus occupies a surface the size of a nickel; on the right side below the palatine arch there is a bean-sized, dark bluish-red tumor, whose volume changes, the circumference of which consists of festooned vessels overlapping; a similar, though larger tumor the size of a hazel-nut, is found laterally in front of the ary-epiglottic fold at the edge of the right sinus pyriformis. Neither in the circulatory apparatus, nor in the organism were any other pathological changes found.

Two Cases of Lupus of the Larynx. By DR. J. SAFRANEK.

Case 1. Man, 36 years old. The epiglottis is thickened throughout, covered all over, especially on the edges, with numerous nodules the size of a pin-point, which here and there have broken down into small superficial ulcers, some of which have cicatrized in places, and in other places fresh nodular eruptions are seen. The ary-epiglottic folds are likewise thickened and streaked with nodules; the false cords are also infiltrated, a lupous infiltration is found below the cords, while the true cords are free. Nose and throat, as well as the skin, show no lupus changes. The patient has no fever, no sign of tuberculosis. No tubercle bacilli in the sputum. The case is one of primary lupus of the larynx.

Case 2. Man, 29 years old, shows besides lupus vulgaris of the external nose and face, a widely distributed lupus of the mucous

membranes of the upper air-passages, nose, palate, and larynx, especially the epiglottis and ary-epiglottic folds showed typical nodules. The remaining organs are healthy.

The cases are being treated according to Pfannenstiel's method and will be demonstrated again after a complete course of treatment.

DISCUSSION.

DR. E. POLLATSCHEK said he had seen good results from trichloracetic acid. Such processes often continue for years without getting worse, and run their course usually without pain.

DR. E. MAUMGARTEN said that years ago he had demonstrated a primary case. Tracheotomy had to be done. After some time he saw her again when she was pregnant, and afterwards an artificial abortion had to be produced. The condition improved strikingly without local treatment.

Embryonal Cysts of the Palate and Retro-pharynx. By PROF. A. ONODI.

Onodi observed, in an eight months fetus, a cyst filled with embryonal gelatinous matter, on the palate and retro-pharynx. The retro-pharyngeal cyst was 10 mm. long, 13 mm. high, and 16 mm. wide.

Regarding the Recessus Frontalis. By PROF. A. ONODI.

In the anterior upper part of the middle meatus, above the line of insertion of the middle turbinate is found a bulging of the recessus frontalis, sharply limited. Individual anterior ethmoidal cells may also open there. Ritter and Heyman call this bulging "infundibulum," the lower part of the hiatus semilunaris. Onodi lets this designation stand, as well in the older, as in the newer definition, and retains, besides the designation of the hiatus semilunaris between the processes uncimatus and the bulla ethmoidalis, the afore-mentioned bulging, the recessus frontalis. This recessus frontalis may be absent, and the frontal sinus open into the recessus bullaris, above the bulla ethmoidalis. In one case the frontal sinus opened indirectly through the interposition of an anterior ethmoidal cell, into the middle meatus of the nose. Onodi demonstrated, by means of specimens, the relation of the frontal sinus to the recessus frontalis and to the hiatus semilunaris.

SURGICAL AND RHINO-LARYNGOLOGICAL SECTIONS

Joint Meeting March 11, 1911.

DR. PAUL KUZMIK, CHAIRMAN.

Exposure of the Skull and the Brain through the Accessory Sinuses of the Nose. By PROF. A. ONODI.*(Abstracted in THE LARYNGOSCOPE, p. 1082, November, 1911.)*

DISCUSSION.

DR. A. GYERYGAI said that he demonstrated at the German Laryngological Congress in Dresden, in 1910, his method, which makes it possible to examine directly the post-nasal space and the most posterior part of the nasal cavity and to complete the operation without preparatory operation. By this method the hypophysis can be reached after the removal of the lower and upper edge of the sphenoid cavity, as he demonstrated on the skulls of the cadaver and by Roentgen pictures.

DR. B. ALEXANDER said that to judge correctly the relationship of the frontal sinuses, the ethmoidal cells and the sphenoidal cavity, one needs Roentgen pictures that will show without any flaw, all of these cavities, in the facial as well as in the lateral position, i. e., one needs pictures that make a comparison possible. He demonstrated by Roentgen pictures, those relations that are to be considered in the examination of the sella turcica in a normal condition and in cases of morbid changes of the hypophysis.

DR. R. LANG pointed out that the method, according to West and others, for an endo-nasal exposure and extirpation of tumors of the hypophysis, may be precisely performed on a cadaver, but on the living they are accompanied with great danger, and therefore Lang thinks that the operation for these tumors of the hypophysis belongs to the realm of general surgery.

DR. J. SAFRANEK shares the opinion of Lang in that the operation of hypophyseal tumors by the endo-nasal route is difficult and needs great practice, but that the hypophysis can be reached this way is proven by the cases of Hirsch and others in which no disturbances occurred during the operation. As to the results, the endo-nasal method shows the same results as the other methods. According to Safranek, Hirsch deserves great recognition for the development of the endo-nasal method.

A. ONODI said that endonasal hypophysectomy marks a distinct progress in rhinology. Even the surgeons declare the method justified. The method of Hirsch is not acceptable in every case; in some cases Kocher's method is to be followed.

**AMERICAN LARYNGOLOGICAL, RHINOLOGICAL
AND OTOLOGICAL SOCIETY.**

Seventeenth Annual Meeting, Atlantic City, June 1, 2 and 3, 1911.

CHEVALIER JACKSON, M. D., CHAIRMAN.

SYMPOSIUM—DISEASES OF THE SALIVARY GLANDS.

Anatomy and Physiology of the Salivary Glands. By R.
JOHNSON HELD, M. D.

Dr. Held opened the symposium with a résumé of the chief anatomical and physiological features of the salivary glands, his object being to introduce a framework for the more practical part of the symposium, rather than to present an account of original research. The subject was discussed under the following heads: (1) The anatomical structure of the parotid, sub-maxillary and sub-lingual glands. (2) The histological structure of these glands. (3) The secreting cells. (4) The mechanism producing activity of the secreting cells. (5) The changes in the glands during secretion. (6) The quantity, character and properties of the fluids secreted. (7) The conditions affecting the secretions.

The glands were classed in the following group: the labial glands in the submucosa of the lips; the buccal glands, found between the buccinator muscle and the oral mucous membrane; the palatine glands found in the mucous membrane of both the hard and soft palates, and especially on the uvula; the molar glands in the mucous membrane behind the last molar teeth; and the lingual glands which are situated beneath the mucous membrane of the tongue, particularly in the region of the circumvallate papillæ and along the lateral margins.

It should be noted in operating upon the region of the parotid, the largest of the salivary glands, that the space which this gland occupies between the ramus of the lower jaw and the mastoid process, can be increased in size by extending the head, with the mouth open, the angle of the jaw is carried backward and the condyle forward, increasing the width of the space above and diminishing it below. In infants, owing to the obliquity of the ramus of the jaw, the space is broader below when the angle of the jaw projects forward. The parotid gland is important, not only on account of its function, but on account of the relation it

bears to the surrounding parts and the important structures found within the substance of the gland. These structures, from without inward, are: 1. The facial nerve with its cervico-facial and tempero-facial branches. 2. The tempero-maxillary vein. 3. The superficial temporal vein. 4. The internal maxillary vein. 5. The posterior auricular vein. 6. A branch from the tempero-maxillary vein to the internal jugular vein. 7. The external carotid artery and its terminal branches, the temporal and internal maxillary arteries. 8. The great auricular and auriculo-temporal nerves.

On account of the intimate relationship existing between the parotid gland and the external auditory meatus, it should be borne in mind that a parotid abscess may open into the external auditory canal.

Many interesting experiments have been undertaken to show the results from stimulation of the several nerves which supply the salivary glands, in order to determine the exact nature of the act of salivary secretion. The flow of saliva is a nervous reflex phenomenon acting as a result of efferent impulses, affecting the secreting cells directly, while the vascular changes which occur simultaneously may assist, but are not the direct cause of the flow. The flow of saliva is influenced by various physical and mental states. Certain drugs, also, exert an influence over the secretion of saliva.

Symptoms and Diagnosis of Diseases of the Salivary Ducts.

By ROBERT C. MYLES, M. D.

The symptomatology of infectious parotitis was briefly reviewed. A case was cited of chronic inflammation of all three salivary glands and their ducts, with occlusion and swelling of the ducts occurring almost every week for many years, relieved by systematic dilatation of the ducts and the use of astringent and germicidal injections.

Another type of symptoms is presented in cases of chronic supuration, with necrotic changes in the gland, especially after typhoid fever. Such cases frequently end in death.

The most frequent symptom of disease of the salivary glands and ducts, is enlargement of either one or both. Gouty infiltrations are most frequently not detected. The author's set of salivary duct-probes are most valuable for detecting calcareous concretions within the ducts or the glands. A heavy needle, placed in a needle holder at right angles to the shaft, and passed through the suspected area, will frequently detect a stone.

It is very difficult to differentiate between a thyro-glossal and a salivary cyst—when the swelling occurs in the base of the tongue, above the epiglottis.

The author has seen two cases of stones in the sub-maxillary glands where a diagnosis of cancer had been made

Treatment of Diseases of the Salivary Apparatus. By JOSEPH C. BECK, M. D.

Dr. Beck discussed briefly the treatment of each of the following conditions affecting the salivary glands: Ptyalism or Salivation; Aptyalism, Dry Mouth or Xerostomia; Parotitis Epidemica; Sialodochitis, or acute infection of the ducts and glands; Acute supuration of the salivary glands and ducts—abscess; Phlegmonous inflammation of the salivary glands; Ludwig's Angina; Simple chronic hypertrophy; cysts and ranula; air tumors in the salivary ducts; Chronic granulomas of the salivary apparatus; Neoplasms; Calculi; Salivary gland fistula; Salivary duct fistula.

In discussing the treatment of these conditions it is not only necessary to fully understand the anatomy, physiology and diagnosis, but the etiology and pathology must be taken into account in order to comprehensively treat the subject. The management of the diseases of the salivary apparatus, like many of the border-line subjects, is at present still in the hands of various special branches, as the dentist, oral surgeon or stomatologist, general surgeon, laryngologist, and pediatrecian. As a consequence, there are many varieties of treatment, and many contradictory statements.

The treatment may be considered under the heads of: (1) Systemic and preventive treatment of lithiasis. (2) Local treatment, directed toward (a) punctum and ducts; (b) gland proper. (3) The management of the salivary apparatus in acute infectious diseases, especially mumps. (4) The surgical treatment of duct abstraction followed by ranula; (a) stone; (b) cicatricial obliteration following ulceration; (3) neoplasms. (5) The treatment of acute abscess, chronic granulomata and neoplasms of the salivary glands. (6) Treatment of salivary fistulae.

DISCUSSION.

DR. JAMES A. BABBIT expressed himself as having been profoundly impressed by the papers just presented and called attention to the increasing realization within the last few years of the importance of the salivary glands.

The conditions affecting these structures might be grouped under four heads: (1) Those conditions which involve the salivary glands, *per se*, viz., neoplasms; (2) conditions in the oro- and nasopharynx which are secondary to disorders of the glands; (3) defective stages of metabolism which might be of glandular etiology; (4) latent infections, causes and effect of which through connection with most important anatomical structures, may be incident to glandular activity. He has been surprised in treating hospital records of operations upon the salivary glands to find their comparatively limited number. Among the list were fibroma, carcinoma, lymphoma, keratoma and tumors of mixed type. In forty-five per cent of cases listed in two of the large hospitals, operative procedure resulted in facial paralysis, partial or complete.

Especial emphasis was given to the part which he believed to be played by the various metabolic conditions in the pathology of the salivary glands, particularly the parotid from its size and anatomical position. He referred in this connection to the propaganda of Horace Fletcher, who, as is generally known, is an enthusiast upon the subject of "salivary digestion" and "salivary activity" as the keynote of health.

Pathologically and physiologically too much emphasis cannot be placed upon the parotid by reason of its relation to superficial and deep cervical lymphatic nodes, proximity to jugular veins and carotid arteries, and connection with great cranial nerves particularly the facial. It cannot but be a frequent factor in metabolic pressure and metastasis symptomatology.

DR. THOMAS HUBBARD had seen cases of recurrent parotitis. In one the condition was proven to be due to calculus. During ten years the recurrences had taken place as often as once or twice a month. The submaxillary gland was involved. The calculus, which could be felt by means of a probe, was removed under local anesthesia, with complete relief. In another case recurrence took place once in about six months. He had also seen a case of paralysis following appendectomy, with rupture into the external auditory canal near the tympanic ring. This occurred about ten days after the operation.

He had operated upon one case of salivary fistula of the cheek, in a child, employing a method slightly different from that described by Dr. Beck. A curved needle with a small silver wire was used, and the operation was performed under local anesthesia. The duct was completely encircled, and a double perforated shot was

passed over the silver wire and fixed by compression. Daily twisting of the wire brought it through in a very few days. The cure was permanent. The duct was severed between the fistula and the gland, and it drained thereafter permanently into the mouth.

Referring to the etiology of epidemic parotitis, attention was called to the work of Dr. Elizabeth Herb, of Chicago, who had conducted a series of experiments. She had produced experimental parotitis by injecting into the ducts diplococci from a case of mumps. From these experiments and others to the number of 200 or more, it would seem quite probable that the cause of parotitis has been definitely determined.

An interesting condition is emphysema of the salivary glands, caused by high tension, as obtains with players of wind-instruments, glass blowers, and others. Dr. Dorendorf (*Zeitschrift fuer Ohrenheilkunde*) recorded cases in musicians at the Post in Freiburg. Permanent dilatation may occur.

The selective action of the diplococcus, or whatever the definite causative agent may be, upon the acoustic nerve should be more carefully investigated particularly with reference to nerve-deafness. He had had four cases of labyrinthitis with permanent nerve-deafness due to epidemic parotitis. The onset of the symptoms are sudden. Two of the patients were children and two were adults. Symptoms of labyrinthitis came on suddenly in the night,—nausea, vertigo, vomiting, and absolute deafness. In children this is often overlooked; they are not watched carefully enough and subjective symptoms are soon forgotten. One of these patients, the son of a physician, went several weeks before the family discovered that he was deaf. Finally the mother noticed that he did not answer promptly when called, and this was due to the fact that he could not locate the direction of sounds. Hearing was perfect in the other ear whereas tests proved that it was absolutely lost on the affected side. Vertigo, tinnitus and headache were the prominent symptoms of labyrinthine invasion in this case.

Routine and thorough inquiry by otologists as to the causative relation of mumps to deafness, particularly in all cases of nerve-deafness of unknown origin is advised; and further, the duty of resorting to prophylactic measures in order to prevent this should be impressed on pediatricians. Investigation shows that from two to five per cent of the cases of nerve-deafness in deaf-mute institutions has been caused by mumps, and more than two per cent of cases of infective labyrinthitis. These statistics should impress

upon otologists that the study of the relation of mumps to nerve-deafness is important.

DR. JOHN R. WINSLOW referred to a paper on diseases of the salivary glands, read by him about two years ago before the Laryngological Section of the Medical and Chirurgical Faculty of Maryland. Among others two cases of salivary calculus were mentioned in that communication. One was that of a young man who had had recurrent inflammation of the sub-maxillary gland on the left side for which no cause could be found. After several recurrences a small lump was discovered at the mouth of the gland; this was clamped with a hemostat and removed by slitting the duct. It proved to be a calculus, the size of a millet seed. In other words, the cause of the inflammation was a movable calculus which from time to time became impacted and caused obstruction to the outflow of glandular secretion. In the other case a crescentic calculus was removed from an abscess in front of the larynx. It had formed in the parotid gland and had migrated downward in the tissue of the neck.

DR. GEORGE L. RICHARDS, referring to cancer of the salivary glands, said he had made an error of diagnosis in this regard. When the supposed cancer was removed he found at the bottom of it a calculus which was responsible for the entire condition. The general surgeon and the family physician had concurred in the diagnosis of cancer. Calculi are sometimes easy to find and sometimes they are not. Two years ago he removed a sub-maxillary gland in a case in which a piece of straw was the cause of the trouble. The patient had always insisted that he had a piece of straw in the gland, it having lodged there while he was picking his teeth with the straw. He had had three cases in all. He saw Killian do an operation for calculus of the sub-maxillary gland in a case in which a radiogram showed the exact position of the calculus. It could not be found where it was shown to be. When practically the entire gland had been removed it was found much higher than had been supposed. When there is swelling coming on reasonably early and in a person relatively young the presumption is against cancer. In such cases calculus can usually be found.

DR. M. D. LEDERMAN called attention to the fact that calculi may exist in the salivary ducts without giving rise to acute symptoms. He cited the case of a young man with a rather severe infection of the neck, resembling a so-called Ludwig's angina. He was unable to swallow; the saliva poured over his lips, his tongue protruded,

and he had an elevation of temperature. Both sub-maxillary and sub-lingual glands on the left side were swollen and tender. The possibility of an infection of a streptococci nature was considered. The patient said a year or two before he had expectorated some hard substance, but had no local inflammatory symptoms at that time. On passing the finger over the floor of the mouth a hard substance could be felt. Incision was made and a calculus, three-quarters of an inch in length, was found. This had obstructed the sub-lingual and sub-maxillary ducts. By milking the glands pus was drained through the incision. The patient made a complete recovery.

The speaker called attention to the universal habit of chewing gum and suggested that the hyper-activity of secretion caused thereby may have some unpleasant effect upon the function of these glands.

DR. L. B. LOCKARD reported a case which he had seen a number of times through the courtesy of Dr. T. E. Carmody.

The patient, a man of 24 years, had had pulmonary tuberculosis for two years, when a hard swelling of the right parotid gland appeared which was diagnosed as mumps. After one week some softening occurred and upon incision an ounce and a half of pus was evacuated. This contained diplococci. Suppuration continued and five weeks later the cavity was curetted and microscopical examination showed large numbers of tubercle bacilli but no diplococci.

About this time the right parotid became swollen and tender, and the pus evacuated by incision contained both the diplococci and tubercle bacilli. The diplococci were identical with the organism of parotitis.

At the end of five months there is still a purulent discharge on the right side: on the left there is nothing but saliva.

DR. GEORGE F. KEIPER recommended the administration of potassium iodide in cases of dry mouth from insufficient salivary secretion. He called attention to the possible relation of bulbar paralysis to apparent increase of salivary secretion.

DR. JOHN F. CULP emphasized the fact that calculi may exist in the ducts of the salivary glands for some time without giving rise to symptoms. He had had under his care a policeman who had had trouble with one of his parotid glands for about three years. It would swell, become very painful for twenty-four to thirty-six hours, then subside. He was sure that the trouble was due to a

calculus, he probed for it but did not find it. Finally the patient came to him with the report that a hard stone had passed out of his mouth and that he was now all right. He has had no trouble since.

DR. NORTON L. WILSON reported a case similar to that mentioned by Dr. Hubby, in which abscess of the parotid ruptured into the external auditory canal, except that in his case it followed typhoid fever.

DR. MYLES, in closing the discussion, mentioned an interesting case in which the stone was in the sub-maxillary gland, and the fistulous tract opened at the glosso-epiglottic fold. Immediate action was necessary in order to prevent suffocation. He thought it was a thyro-glossal cyst, but it proved to be a salivary cystic fistula. The cavity was opened and a stone removed. One should be persistent in the effort to make a diagnosis, as these patients suffer much more than might be supposed. When the stone is in the duct spontaneous temporary relief frequently occurs. Spasm or swelling of the duct closes its lumen around the calculus shutting in a certain amount of secretion behind the stone and this causes great distress. When the duct is sufficiently dilated by the retained secretion the obstruction is relieved and the discomfort subsides.

Direct Laryngoscopy. By E. FLETCHER INGALS, M. D.

The procedure of direct laryngoscopy has not yet come into universal use by laryngologists, the majority of whom favor the older indirect method. The reasons for this are: (1) The necessity for special and expensive instruments. (2) The difficulty of keeping the apparatus in order, especially the lighting system, when it is not in constant use. (3) The time consumed. (4) The limitations of the method as regards certain cases. These objections far outweigh the advantages in the majority of cases in which inspection of the larynx is made, and in a large per cent of cases where operative measures are to be adopted. There are many cases, however, in which direct laryngoscopy is of great value. In persons with sensitive fauces, with thick tongues, with short and thick or stiff necks, this method is often impracticable without thorough local or general anesthesia. The chief indications for direct laryngoscopy are as follows: (1) For the removal of impacted or embedded foreign bodies in the larynx, and the recovery of those that are in positions inaccessible by the indirect method. (2) For diagnosis of laryngeal conditions in infants and children with whom the indirect method cannot be employed, as in the presence of papillo-

mata, stenosis, malformations, etc. (3) For the inspection of certain parts of the larynx or trachea that are more or less invisible by means of the mirror, and for the treatment of lesions in such localities. (4) When a better picture of a condition is desired than can be obtained by the indirect method.

The chief contra-indications are: High-grade dyspnea from various causes; uncompensated heart lesions; aneurysm of the aorta; myocarditis; arterio-sclerosis of considerable degree; conditions causing high blood-pressure; extreme weakness; severe hemoptysis.

Preparation of the patient consists in abstinence from food for six hours and from drink for two or three hours previous to examination. The position of the patient is the upright or recumbent, the latter being better, perhaps, in children because they can thus be held better. The instruments required are the open tube laryngeal speculum or long tube with spatula end. Atropine and morphine given two hours before the operation lessen the secretion and quiet the patient.

Edema of the larynx is to be guarded against after the operation, especially in children. Tracheotomy may be necessary. The croup tent is of value in the after-treatment of these cases.

Endoscopic Treatment of Asthma. By W. FREUDENTHAL, M. D.

Freudenthal referred to his efforts for the past three years in the treatment, endo-bronchially, of various diseases, such as chronic bronchitis, pulmonary tuberculosis, and especially asthma. The present communication dealt solely with this method of treatment in cases of so-called essential asthma, otherwise known as bronchial or reflex asthma. The etiology of this form of asthma was briefly discussed. Four cases treated by the endoscopic method were detailed, and seven others mentioned. Out of the total of eleven cases treated endo-bronchially, eight can be considered cured, three greatly improved, and two not benefited at all. It would appear that these data compare favorably with the results obtained by other methods.

In all the cases bronchoscopy was employed under local anesthesia, the patient being kept in the upright position. The treatments were given in the morning, the patient's stomach being empty. Some pain always followed bronchoscopy, in some cases lasting three or four days, in others only a few hours. The treatments given were repeatedly and occasionally many times before the patient was pronounced cured.

The author is convinced from his repeated endo-bronchial examinations that there are asthmogenous points in the bronchial as well as in the upper respiratory tract, and that by attacking these points directly by topical endo-bronchial applications the foundation is laid for a new means of combating and conquering bronchial asthma.

Dr. Richard Hall Johnston said the straight method of direct laryngoscopy is particularly valuable in infants, young children and adults under general anesthesia. He never employs anesthesia of any kind in infants and young children as it is dangerous up to 5 years of age. The method of procedure is as follows: The little patient is pinned in a sheet so that the arms and legs are practically immovable. He is then placed on the table with the head in the normal straight position. An assistant holds the head while nurses look for the arms and legs. The operator stands at the left of the table facing the patient and holds the modified Jackson speculum in the left hand. The mouth is forced open if necessary and the speculum passed straight down between the incisor teeth. When the epiglottis comes into view the spatula end of the instrument is hooked around it. Slight pressure upward on the handle suffices to bring the larynx into view. In adults with short, thick necks the entire larynx is sometimes not seen; in such a case an assistant is told to push the thyroid cartilage back when in most cases the anterior commissure comes into view. When direct laryngoscopy is performed in the sitting position the head is extended slightly and turned to the right or left. The instrument is introduced between the bicuspid teeth, the tongue pushed to the side and the epiglottis pulled forward. If the anterior commissure is not seen the nurse is instructed to push the head forward until a straight position is assumed when all parts of the larynx are seen. The force required to manipulate the instrument is slight.

Dr. G. HUDSON-MAKUEN asked whether it is customary to give atropin before the operation, as suggested by Dr. Ingals. In the case just reported by the speaker 1/200 of a grain of atropin was given. There was not a particle of secretion at the end of the tube during the operation, which lasted an hour. There was no closure of the glottis during the direct laryngoscopy preparatory to putting in the bronchoscopic tube, so that it was not necessary to wait for the larynx to open, as directed by Jackson in his book. Dr. Makuen asked whether the sphincter-like closing of the glottis is always noted. It was with great difficulty that he was able to remove the tube at all on account of the spasm of the glottis. Perhaps the

tube was too large for the glottis in this case. There was a very strong grip on the tube, which came out with a snap.

He asked Dr. Freudenthal whether the operations which he had described were done in his office, and whether the patients were immediately allowed to go home. What anesthetic was used in the last case? Does Dr. Freudenthal recommend a general anesthetic and the employment of the bronchoscopic method in the treatment of asthma in nervous individuals? Does he consider this so important a method in the treatment of this condition as to warrant the giving of a general anesthetic?

DR. GEORGE L. RICHARDS, referring to the question of giving an anesthetic to children in making a bronchoscopic examination, cited a case in which he came near to losing a patient. The anesthetic was given and the instrument passed, by a member of this Society, when the child suddenly ceased to breathe. The tube was withdrawn and breathing re-established, but the only reason for the child's being alive is that tracheotomy had already been done. No fault in technic was responsible for this unpleasant experience.

DR. THOMAS J. HARRIS considers tracheotomy of decided advantage. One must reckon, however, with a series of cases in which good results cannot be obtained in this way, cases in which there is a good deal of ossification of the cartilage, and where the neck is so stiff that the parts cannot be seen without a general anesthetic. In such cases Bruenings' contra-pressure instrument has proved of advantage. Bruenings himself has called attention to the use of the instrument with satisfactory results in cases of this class. By this means the larynx is pushed in at the same time that pressure is made outward.

DR. ROBERT C. MYLES said the peculiar spasm to which the trachea and the bronchi are subjected in asthma is a habit-spasm due to the constant state of hyperemia of these parts, and a reflex central irritation. He had been experimenting for several years with tracheal and bronchial medicaments using adrenalin, menthol, carbolic acid, iodoform, and various other agents in liquid albolene as an injection. Marked relief had been obtained at times, due either to the anesthetic effect of the drug, or to the brutalizing of the parts. In chronic diseases of the rhino-pharynx and nose great quantities of pus flow down the trachea and the bronchi, rendering them more or less immune to foreign agents. This is due to the obtunding effect on the mucous membrane, and this, probably partly explains Dr. Freudenthal's success.

DR. FREUDENTHAL, in closing the discussion, presented some instruments used by Ephraim for anesthetizing the trachea and bronchi and some rare books published in the earliest period of laryngoscopy in Germany.

Referring to the use of atropin, he said he usually gives it in 1/100 grain doses, but had found that it had no effect whatever upon the secretion. It is necessary, of course, to differentiate between foreign body and asthma. He had made a few of these bronchoscopic examinations in the clinic, but they were unsatisfactory. It is better to do it early in the morning, before the patient has had any breakfast.

Anesthol, to which he referred, is composed of equal parts of ether, chloroform and alcohol. As a rule he does not use a general anesthetic. He agreed with Dr. Myles and Dr. Shurley, that the bronchoscope stirs up the secretion, serving as a means of expression of the secretion which is present, and of which the patient cannot get rid otherwise.

Referring to Dr. Shurley's suggestion about a classification of cases, he called attention to the fact that he had done this in the paper. He would not, for example, employ this method in a case of uterine asthma.

Answering Dr. Barnhill's question as to how a cure is obtained, he said it is difficult to tell. Surely a single introduction of the bronchoscope could not cure asthma unless by auto-suggestion. He had required six, eight, and ten weeks, at the same time putting the patient under better hygienic surroundings.

Orthoform is indicated where there is superficial erosion. The soreness is thus relieved, and the patient is more comfortable and does not manufacture so much phlegm as usual when the bronchoscope is introduced. In the absence of ulceration or soreness, he used adrenalin to which he added 2 to 3 drops of oleum menthal pip.

Fibrous Polypi of the Naso-pharynx. Report of Three Cases, with Exhibition of Specimens. By W. A. WELLS, M. D.

Original Contribution to THE LARYNGOSCOPE, p. 787, July, 1911.

Four Cases of Naso-pharyngeal Fibroma. By WILLIAM B. CHAMBERLIN, M. D.

Naso-pharyngeal fibromata are rare tumors which arise from the fibrous tissue covering the basilar process of the occipital bone, as well as from the sphenoid bones. They are exceedingly hard and

dense, rich in blood supply, and possess a marked tendency toward rapid growth, frequently invading the nose, its accessory sinuses and even the skull cavity. For this reason they are very dangerous to life and demand destruction or removal. Histologically they consist of fibrous tissue with occasionally a suggestion of sarcomatous degeneration. They do not form metastases. Males are more frequently affected than females and between the ages of 10 and 25 years. After the age of 25 years there is a tendency toward spontaneous disappearance. Fibromata of the naso-pharynx must be differentiated from pseudo-naso-pharyngeal polypi, from those springing from the borders of the choanae as well as from sarcoma.

The following symptoms may occur in different cases and at different stages of the development of naso-pharyngeal fibromata: Nasal obstruction; anemia, if bleeding is frequent; dyspnea; dysphagia; deformities of nose or face; neuralgias; involvement of the middle ear. Death may result from anemia, due to hemorrhage, or from meningitis, as the result of extension into the skull cavity.

Treatment may be palliative or radical. Cure is effected in certain cases by electrolysis or galvano-cauterization. Removal may be accomplished through the natural passages, the nose and the mouth or in extreme cases after a preliminary tracheotomy and resection of the superior maxilla. The author briefly reported four cases.

DISCUSSION.

DR. HARMON SMITH called attention to the frequency of error in hospital records with reference to the cases under discussion, many cases which are called intra-nasal fibromata being in reality myxomata. He recalled three cases which had been treated by injections of monochloroacetic acid, two under his own direction and one under that of his Chief of Clinic, Dr. McPherson. All of them made perfect recoveries. Seven years ago he had modified Coffin's syringe by making the needle longer, so that the acid could be injected deeper into the tissues. He protected the needle by a jacket which concealed the point until the location for injection had been reached, when at the will of the operator the needle could be unsheathed and inserted into the tumor, where the injection had been made, the sheath could again be run into place before its removal and the cup-like end of the sheath would catch the excess of acid that might exude upon withdrawing the needle. The sheath protected the soft palate and adjacent structures against injury from the needle while in the act of reaching the tumor. It worked well.

In another case with Dr. Charles H. Knight, the first attempt to remove the growth was unsuccessful. The screw of the snare broke and for a while it seemed that we would be unsuccessful in disengaging the snare loop, but by main strength of a surgeon present the wire was drawn through the growth and it was completely removed. The case recovered. The operation was followed by considerable hemorrhage. It seemed to him to be inadvisable to do the major surgery formerly resorted to in these cases. There is just as much danger from radical surgery or from the wire loop as from the manipulation of the acid. If shock from a major operation and the dangers of hemorrhage can be overcome, one is justified in resorting to radical surgery.

DR. D. J. GIBB WISHART said his experience with the cases under discussion is extremely limited. They do not seem to be very frequent in a northern climate. In operating upon these cases one could not afford to confine oneself to any one line of procedure. It is necessary to determine the point of origin of the growth as well as that to which it has extended, and proceed accordingly. Where the growth has extended into the sphenoid sinus, for example, or into the antrum, a different line of treatment must be followed from that employed where the growth is adherent to the walls of the nasal cavities, pushing downward. If it is in the nasal cavities it is much more easily removed than when it has invaded the antrum or the sphenoidal cells. In the latter event one must adopt a radical procedure. When this is necessary it should be borne in mind that the growth must be removed in its entirety, including the pedicle. Where the growth is adherent to the sides of the nasal cavity removal is difficult unless a part of the turbinals is also removed. In this event a procedure should be adopted which will give as little scar as possible. Even the radical operation leaves no more scar than was formerly left by other procedures. The absence of scar in a well-done Killian operation on the nose on the sphenoid is remarkable, and curved incisions on the side of the nose leave very little scar. In the operation suggested by Watson Williams, which none of the speakers had mentioned, a part of the Killian incision is adopted. The side of the nose is laid open and a part of the turbinal bone removed, healing resulting without scar.

In dealing with hemorrhage in these cases he would feel disposed to open the crico-thyroid membrane and to give an anesthetic through the opening, then to pack the pharynx with sponges. He had adopted this procedure in several instances in operations on the nose where great bleeding was to be anticipated.

DR. SWAIN had had a case similar to number four of Dr. Chamberlin's series. He had great difficulty in saving the patient, who, nevertheless, has reached man's estate without further trouble until within the past year, when he had a terrible hemorrhage. This last he also survived.

It is well known that these tumors are rare, comparatively, and very rare in young girls. The only case he has had among the latter proved to be almost identical with psammoma. No snare would cut through it. He was unable under general anesthesia to wrench it out by means of large forceps, and it bled hardly a spoonful. It was found to be very poor in blood vessels, with a great deal of fibrous stroma, very much like a uterine fibroma. In this tissue scattered in smaller and larger masses were the hard, sand-like particles. He had tried to remove another naso-pharyngeal fibroma, and he had never seen greater hemorrhage than resulted in this case, except where the longitudinal sinus was cut. Packing through the posterior nares and the injection of salt solution proved successful in saving the patient's life. In another case upon which he operated the tumor which was poor in blood vessels came out very easily. These tumors vary from those which are very easily enucleated to those which are practically irremovable.

(To be continued).

Salvarsan in Non-syphilitic Ulceration of the Mouth and Throat.

P. H. GERBER, *Munch. med. Wchnschr.*, Feb. 28, 1911.

Gerber advances clinical evidence to prove that Vincent's angina, and other inflammatory buccal and pharyngeal effects, are due to spirochetes. He instances gingivitis, simple and mercurial stomatitis, scorbutus and even noma as resulting from invasions of spirochetes through a slight lesion. Therefore these cases may be successfully treated by drugs which counteract the spirochetes, as proved by the results in three cases successfully treated by salvarsan.

ED.

BOOK REVIEWS.

Handbuch der speziellen Chirurgie des Ohres und der Oberen Luftwege.

Edited by DRs. L. KATZ, H. PREYSING, F. BLUMENFELD. Band 1, Lieferung 1-9. Wuerzburg Curt Kabitzsch (A. Stuber's Verlag), 1911.

I. Topographical anatomy of various regions.

The first half of volume I of this extensive hand-book of the special surgery of the ear and upper respiratory tract, has now been completed and contains the following exhaustive monographs:

(a) The topographical anatomy of the head, exclusive of the accessory sinuses of the nose and of the ear, by Dr. Sobotta, Professor on anatomy of the University of Wuerzburg.

(b) Topographic anatomy of the nose and its accessory cavities, by Prof. Dr. O. Onodi, Director of the Rhino-Laryngologic Clinic in Budapest.

(c) Topographic anatomy of the organ of hearing. By Prof. Dr. Stenger, of Koenigsberg.

(d) Topography of the oro-pharynx, by Prof. J. Sobotta, of Wuerzburg.

(e) Topography of the neck and of the mediastinum, by Prof. J. Sobotta, of Wuerzburg.

(f) The lymphatic system of the head and neck, by Prof. August Most, of Breslau.

II. The principles of anesthesia.

(a) The principles of general anesthesia, by Dr. R. Hecker, Docent in surgery at Marburg.

(b) Local anesthesia of the nose and throat, by Prof. Paul Heymann, of Berlin.

(c) Local anesthesia of the ear, by Prof. O. Voss, of Frankfort a. M.

III. The therapy of artificial hyperemia, by Prof. Isemer of Halle.

IV. Medical legal evidence in operated cases, by Prof. Friedrich Roepke, of Solingen.

The monograph of Sobotta on the topographic anatomy of the head, and of Onodi on the topographic anatomy of the nose and accessory cavities have been reviewed in the June, 1911, issue of THE LARYNGOSCOPE, p. 750.

Topography of the organ of hearing. The topographic anatomy of the organ of hearing is carefully considered by Stenger in a monograph of seventy-two pages, containing many illustrations in the text and four full-page colored lithograph-plates. The author discusses the embryologic development of the temporal bone and its topographical details, the definite bone-centers and their topographical details, the gradual growth and changes in the temporal bone, the anatomy of the middle ear, the topography of the tympanic cavity and of the ossicles, the growth of the mastoid process, anamolies and different types of this area.

The topography of every section of the temporal bone and its adnexa is given careful consideration, and special attention is directed towards the discussion of the position and land-marks of the drum-membrane, the mastoid process, the tympanic cavity, the floor of the tympanum, the attic, the several walls of same, the mastoid antrum, the relations of the Eustachian tube in the tympanic cavity and a detailed description of the facial nerve throughout its course in the temporal bone of the topographical land-marks and the various component parts of the labyrinth. There is also considered, variations in the course of the facial nerve, the cerebral sinuses in their relation to the ear, variations in the sigmoid sinus and the bulbs of the triangular vein, the relations of the bulb of the sigmoid sinus and of the carotid artery of the tympanic cavity, ab-

normal venus anastomosis and finally the topography of the sinus petrosa, superior and inferior.

This is an especially important and opportune monograph, appearing as it does in the period of such unusual activity and development in the surgery of the deeper structures of the temporal bone. The illustrations are remarkably clear and the text terse.

Topography of the oro-pharynx. Like the monograph on "Topography of the head," Sobotta's section on the "Topography of the oro-pharynx" is a modern classic. The fourteen full-page plates with every detail of anatomy carefully indicated constitute the most important feature of this section.

Following this chapter is one by the same author on the "Topography of the neck and mediastinum," which includes the same careful consideration of all the details of the anatomy of the larynx, trachea, esophagus, thyroid gland and mediastinum and accompanied by fifteen full-page colored plates.

The lymphatic system of the head and neck. Much interest is centered at present on the question of the lymphatic apparatus of the head and neck. The last International Rhino-Laryngological Congress at Berlin in August, 1911, took up this question very thoroughly in a carefully prepared symposium, and several exhaustive papers have been published lately on this subject.

The monograph of Most contains a complete bibliography and in it are discussed in successive paragraphs the lymphatics of the sub-mental, sub-maxillary, infra-auricular, parotid, mastoid, retro-pharyngeal and para-tracheal regions. The special anatomy of the lymphatic supply of the ear, external nose, oral cavity, tongue, pharynx, larynx, trachea and esophagus is separately discussed. Four lithographic plates illustrating the position and relation of the lymphatic glands and channels of the external nose, face, neck, external ear, interior of nose, Eustachian tube, retro-pharyngeal glands, and the lymphatic vessels of the larynx and tracheo-bronchial region accompany this chapter.

Section 2, volume 1, part 1, considers the principles of anesthesia. The first part by Haecker discusses general anesthesia. Chloroform narcosis with special reference to its application in head surgery is referred to, with particular mention of the physiological action of the drug, the preparation for anesthesia, the position of the patient for the several types of operation, the accidents of narcosis, the methods for their prevention, the after-care of the anesthetized patients, and the technic of narcosis.

Similar consideration is given chapters on ether and mixed anesthesia.

Added interest centers in chapters on aseptic narcosis in operations on the mouth and nose, its administration through the tracheal cannula and by methods of Kuhnt. To the use of morphin in combination with skopolamin and atropin space is given as also to the various types of anesthesia by means of nitrous oxide, somnoform, ethyl chloride, kelen, etc.

Local anesthesia of the nose and throat is the chapter assigned to Heymann. He presents briefly the history of the introduction of cocaine, the mechanism of its application, the action of local anesthesia on the mucosa of the nose and throat, the strength of the solutions, the technic of application, the question of local anesthesia in the nasal mucosa by sub-mucous injection, the Schleich method and its application to the surgery of the neck, and a consideration of the several successfully used drugs and combinations for local anesthesia.

Local anesthesia of the ear by Voss. In this chapter mention is made of ethyl chlorid or ether spray as a local anesthetic for operations on the external ear and auditory canal, the Neumann method of injecting cocain-adrenalin in operations on the tympanic cavity, the membrana tympani, and even the radical mastoid operation, and the Schleich infiltration to close persistent retro-auricular fistulae.

The next chapter is that of Isemer on artificial hyperemia in its application to the ear, nose and throat. Bler's methods as applied to these

areas are described in detail, as are the suction treatment of Sonderrmann in acute and chronic otitis media. The author cites the value as a diagnostic method of several forms of suction for the determination of the character of the secretion of the accessory sinuses and nose, and the application of this suction therapy for evacuating such pathological fluid contents from the sinuses.

The final monograph of the first part of volume 1 is that of Roepke on "Medical opinion in operated cases." This deals largely with the question of the opinions and the prognosis made in operated cases of life-insurance. The prognosis of cases following the various operations on the ear, nose and accessory sinuses, and on the larynx is detailed in several paragraphs.

Cases operated following accidents and injuries to the ear, nose and throat are grouped in a second chapter. Further paragraphs are devoted to the position of the surgeon in his relation to operated cases who have interests in sick-benefit associations, military service, and finally to medico-legal opinion and expert testimony of the oto-laryngologist when called into court.

While this splendid series of monographs which constitutes volume 1, part 1 of this valuable "Hand-book of the special surgery of the ear and upper respiratory tract," is published in German, it is none the less one of the most valuable publications even to readers of English, in our specialty, that have as yet appeared in oto-laryngological literature. The text is so clear and is so systematically arranged, and the illustrations and colored plates are so numerous, so artistically executed, and so satisfactorily labeled that even readers unfamiliar with German can easily avail themselves of the immense amount of up-to-date literature, technic, therapy, and other data teeming in these pages.

M. A. G.

Die Sprache des Kindes und ihre Störungen.

By DR. PAUL MAAS, Specialarzt fuer Ohren-, Nasen-, Halsleiden und Sprachstoerungen in Aachen. Pp. 125, with 16 illustrations. Curt Kabitzsch, Wuerzburg, 1909. Price M. 2.80.

In Germany there has been considerable activity in the study of speech and its defects in relation to the growing child, and much is being done to familiarize the intelligent layman with the scientific data in this field that may be within his reach.

This monograph sets forth the development of speech, defects of speech, the various pathologies and entities that unfavorably influence the growing child, and discusses briefly the most practical and tangible methods of relief.

Those of our readers familiar with German will find it quite worth while to peruse this little book.

M. A. G.

LISTERINE is a powerful, non-toxic antiseptic. It is a saturated solution of boric acid, reinforced by the antiseptic properties of ozoniferous oils. It is unirritating, even when applied to the most delicate tissue. It does not coagulate serous albumen. It is particularly useful in the treatment of abnormal conditions of the mucosa, and admirably suited for a wash, gargle or douche in catarrhal conditions of the nose and throat.

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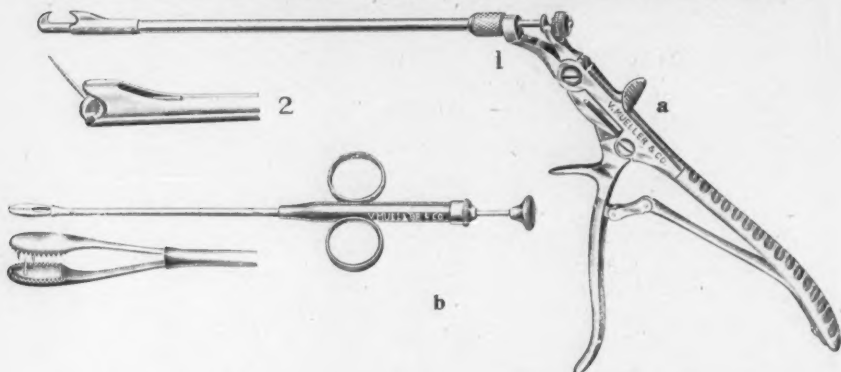
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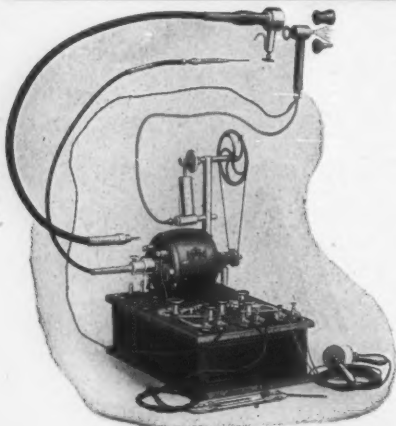
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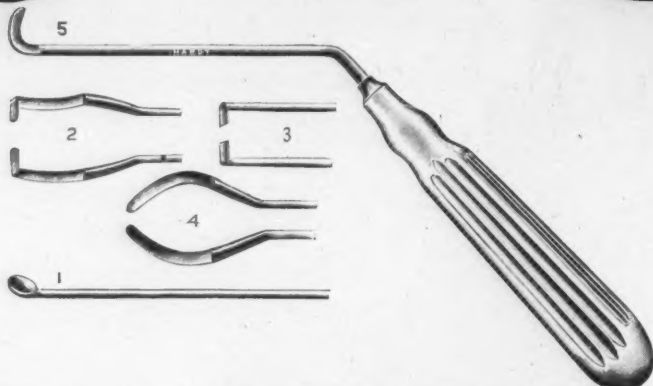
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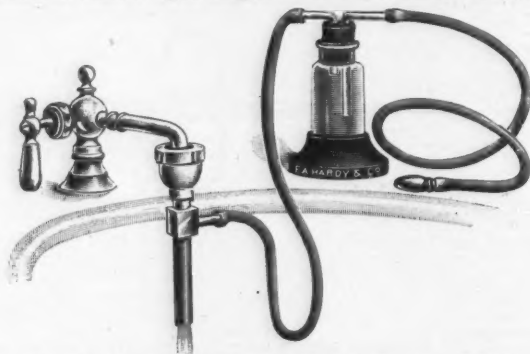
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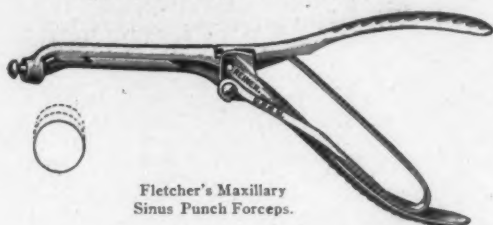
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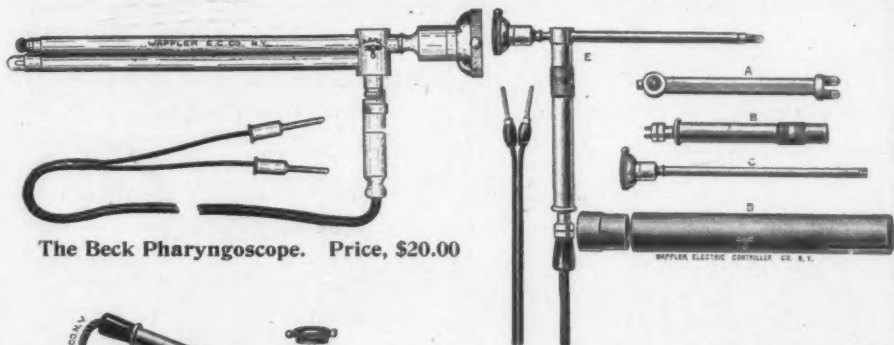
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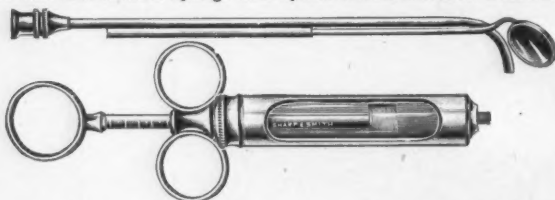
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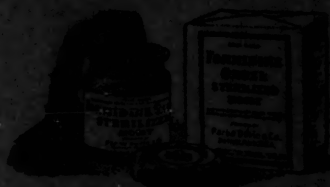
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